

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 722.—Vol. XIX.]

LONDON, SATURDAY, JUNE 23, 1849.

[PRICE 6D.]

TO ENGINEMAKERS, BOILERMAKERS, IRONFOUNDERS, AND IRONMASTERS IN GENERAL.

MR. G. O. BROWN begs to announce that he has received instructions from the proprietors of MILTON IRON-WORKS, near BARNESLEY, to submit to PUBLIC COMPETITION, BY AUCTION, on Monday, the 23rd day of June next, and following days (Saturdays and Sundays excepted), until the whole are sold, at the WORKS, the

EXTENSIVE STOCK

Of engine-makers, boiler-makers, iron-founders, fitters, and turners' tools, 30 hearths of smiths' tools complete, steam-engines, slotting machines, 2 railway wheel lathe, boiler-plate bending machine, cupolas, fans, and shafting, screwing and nut machines, a large pipe-proving machine, and various other machinery suitable for the iron trade, 10 double and single purchase crabs, various blocks and ropes, metal and other cranes, 2 road weighing machines, 3 filling machines, and 1 smaller weighing machine, a large strong fly punch, a set of large three legs, crab, and breaking ball, 600 tons of forged pig and refined plate metal, 100 tons of bar and rod-iron (various sizes), a quantity of English oak and other timber, the whole of the office furniture, fittings, and fixtures, which are very good and complete, together with

A FINE BRICK FURNACE LINING.

complete, a quantity of seasoned hearthstones and damstones, and a great variety of other articles, which cannot be enumerated here, but which will be particularised in catalogues before the sale.

MR. G. O. BROWN has also received instructions to OFFER FOR SALE, BY PUBLIC AUCTION, at the same time and place as above (unless a treaty be concluded previously by private contract), all the STEAM-ENGINES, CUPOLAS, MACHINERY, pipe-proving engines, cranes, wood, and iron models and patterns, metal casting boxes, core barrels, drawing and working plans, lately used by Messrs. Graham, in carrying on their extensive Foundry and Engine Manufactory at Milton Iron-Works.

As the casting and engine department will not in future be carried on at the Milton Iron-Works, a LEASE will be GRANTED to any eligible party applying for a PLOT of GROUND near the Elsecar Colliery, and adjacent to the Dearne and Dove Canal and South Yorkshire Railway.

Application to be made to treat by private contract for the last-mentioned articles to Mr. Newman, of Darley Hall, near Barnsley; or to Mr. Woodhouse, of Oversea, near Ashby-de-la-Zouch.

LEAD AND SILVER MINES in the Counties of NORTHUMBERLAND and DURHAM. **MR. CHARLES BROUGH** will SELL, BY AUCTION, on Tuesday, the 24th day of July, 1849, at the Crown and Thistle Inn, NEWCASTLE-UPON-TYNE, at One for Two o'clock.

1st.—All those valuable and current-gold LEAD and SILVER MINES, belonging to the Bulbeck Lead Company, called SILVER TONGUE, in the county of NORTHUMBERLAND, and HYSOP, in the county of DURHAM, with the ENGINES, for pumping and for washing the ores, OFFICES, COTTAGES, MINE SHOPS, MATERIALS, and UTENSILS belonging to the same, situated upon the River Derwent, in the immediate vicinity of Shotley-bridge, about 16 miles from Newcastle-upon-Tyne, and near the Wear Valley Railway.

These mines are divided from each other by the River Derwent, which here forms the boundary between the counties of Northumberland and Durham, and are connected by levels of communication, for the convenience of unwatering the workings, and of washing the produce at central washing floors.

The Silver Tongue Mines are held by lease from the lord of the manor of Bulbeck; and the Hysop Mines from the Dean and Chapter of Durham. The royalty due payable for the former are highly-favourable, and for the latter are moderate. The leases are renewable according to custom. The engines for unwatering the mines, and for crushing and washing the ores are driven by water, and in the best order and efficiency. The right of working extends over a tract of mining ground through which many veins of lead are known to run. Four only have been partially worked, and yield large quantities of ore, rich in silver, and are converging towards a point of intersection with other veins, where a considerable accumulation of ore is expected. From the known productiveness of the lower strata in the very ancient Derwent Lead Mines, there can be no doubt but they will here be equally productive.

2d.—All that valuable SMOELTING MILL, situate at CASTLESIDE, in the immediate vicinity of the above and also other mines, and known as CASTLESIDE SMOELTING-MILL, with all the necessary machinery, horizontal chimneys, and every convenience necessary for smelting lead ore. Together with 2 A. 3 A. 3 P. of therabouts, or FREEHOLD LAND, and 2 A. 3 A. 3 P. of therabouts, of COPYHOLD LAND.

Mr. William Watson, the agent on the premises, will show the mines, and further particulars may be known, and plans seen, by applying to Mr. John Dolphin, mine surveyor, Hunter House, Riding Mill, Gateshead; or Mr. John Douglas, No. 12, Westgate-street, Newcastle.

TO IRONMASTERS, FOUNDERS, &c.

MR. W. D. STARLING is instructed to SELL, BY PRIVATE CONTRACT, a QUANTITY OF OLD RAILS and CHAIRS; also, SEVERAL LOTS OF CONTRACTORS' PLANT.—Application to be made at his office, 13, Change-alley, London, June 14, 1849.

VALUABLE AND EXTENSIVE MINES OF COAL AND IRONSTONE.

TO BE LET, ON LEASE, on most advantageous terms, the COAL and IRONSTONE under a very large tract of land, in the parish of RUABON in the county of DENBIGH, adjoining the Shrewsbury and Chester Railway.

The proprietors of the ESTATES on which the Ponkey and Aberderyn Iron-Works were formerly carried on, have made arrangements TO LET BOTH PROPERTIES TOGETHER, which will give the lessee the facilities to carry on a lucrative business—very rarely to be met with.

The COAL and IRONSTONE on these ESTATES may be raised at very much less than an average cost, and the quantity proved in them (besides what are under a very large portion of one of them, in which there is no doubt they will be found) is estimated will supply iron-works with materials to make 400 tons of pig-iron weekly for upwards of 30 years, as well as 50,000 tons of the much and justly-celebrated Yard and Wall and Bench Coals per annum for sale, for the same period.

Printed particulars of the property, and lithographed plans of the estates, showing the minerals under them, with calculations as to the expense of making iron from them, as compared with that of manufacturing it in Staffordshire, may be had upon application at the office of the Mining Journal, 20, Fleet-street; and at J. Boydell's, 54, Threadneedle-street, London; and at Messrs. Longville and Williams, solicitors, Oswestry, June 6, 1849.

STEAM-ENGINES ON SALE.—No. 1.—A SECOND-HAND DOUBLE POWER CONDENSING MARINE ENGINE, with cast-iron fluming and side beams; cylinder 33 inches diameter, 8 feet stroke; air-pump, lined with brass—no boiler; 47-horse power, with 7 lbs. pressure on the square inch, and very suitable for pumping and winding in a colliery, lead mine, or to drive any kind of millwork.

No. 2.—A DOUBLE POWER CONDENSING MARINE ENGINE, quite new, but unfinished, with cast-iron fluming and side beams; cylinder 48 inches diameter, 30 feet stroke; 91-horse power, with 7 lbs. pressure on the square inch—no boiler; and suitable for the same purposes as No. 1.

No. 3.—A DOUBLE POWER CONDENSING LAND BEAM WINDING ENGINE; cylinder 29 inches diameter, 41 feet stroke; hand gear, with button valves, parallel motion, fly-wheel, wagon boiler, with all its fittings; door, grate, head-plate, &c.; two large cast-iron bell cranks and pedestals, with strong wrought-iron connecting-rods, for pumping water from two lifts of pumps 100 yards deep, two rope wheels, suited for flat chains, apparatus to throw in and out of gear, pit-head pulleys, &c.; 28-horse power, with 7 lbs. pressure on the square inch, and suitable for the same purposes as No. 1.

No. 4.—A NEW DIRECT ACTION ENGINE, double power, suitable for a corn-mill, or winding in coal or lead mine, with improved spring packing for piston, ditto ditto for nozzle valves; cylinder 15 inches diameter, 24 feet stroke, 28-horse power, with 35 lbs. pressure on the square inch—no boiler.

No. 5.—A DOUBLE POWER LAND BEAM ENGINE; cylinder 30½ inches diameter, 4 feet stroke, slide valve, parallel motion—no boiler, and quite new; 52-horse power, with 35 lbs. pressure on the square inch, and suitable for the same purposes as No. 1.

No. 6.—A DOUBLE POWER BEAM WINDING ENGINE; cylinder 15½ inches diameter, 24 feet stroke, with a cast-iron portable frame, slide valve, hand gear, parallel motion, flat-rope wheel, spur and pinion wheels for the same; 28-horse power, with 35 lbs. pressure on the square inch—no boiler, and suitable for the same purposes as No. 1.

No. 7.—A SECOND-HAND PUMPING ENGINE, with cylinder 48 inches diameter, 7 feet stroke in the house and the same in the pit, with air-pump, condenser, hand gear, piston, &c., pumping three lifts of pumps 100 yards; working barrels 14 inches diameter—no boiler; 100-horse power, with 7 lbs. pressure on the square inch.

No. 8.—A NEW DIRECT ACTION ENGINE, double power, suitable for a corn-mill, or winding in coal or lead mine, with improved spring packing for piston, ditto ditto for nozzle valves; cylinder 15 inches diameter, 24 feet stroke, 28-horse power, with 35 lbs. pressure on the square inch—no boiler.

THREE SECOND-HAND CYLINDRICAL BOILERS, 11½ inches diameter, 44 feet length, with spherical ends, and now in thorough repair, and suitable for any of the above engines.

ONE PAIR of 90-horse power SECOND-HAND MARINE BOILERS, that have been working a pair of 40-horse power engines, and are now in thorough repair.

NEW BOILERS of any shape, can be MADE at a short notice, to suit any of the above engines.

For further information apply to EYTON & CO., MOSELEY FOUNDRY, near HOLYWELL, FLINTSHIRE.

VENTILATION OF COAL MINES.

BIRAM'S PATENT ANEMOMETER—price £5 5s.—This INSTRUMENT is now in USE in most of the MINING DISTRICTS, and particulars will be given on application to the patentee, B. Biram, Esq., Wentworth, near BILKHAM; or to the maker, John Davis, mathematical instrument maker, Derby.

JAMES BOYDELL, LAND, MINE, AND MACHINERY

VALUER, AND AGENT.

No. 54, THREADNEEDLE-STREET, LONDON.

HAS TO DISPOSE OF A PATENT RIGHT for BUILDING VESSELS with IRON, on a principle which combines increased strength with greater economy of manufacture.

Also, ONE for the CONSTRUCTION of IRON ROOFS, on a like principle. A specimen of this may be seen as a roof covering one of the retort houses of the Birmingham and Staffordshire Gas Company, by permission of Mr. Cliff, the engineer, at the works.

Also, ONE for IRON JOISTS and RAFTERS, and for a plan of joining large plates and sheets of iron.

The LEASE of a very celebrated FOUNDRY and ENGINEERING ESTABLISHMENT, on the River DEE, complete, with fixtures, machinery and tools, in working order, and ready for any parties to embark at once on building first-class iron steam-vessels, and marine and locomotive engines.

Also, SHARES in, or the whole of a GAS WORK, which supplies exclusively a populous town in Shropshire, and which can be greatly extended.

Particulars of the above may be had, upon application, at 54, Threadneedle-street.

TO ENGINEERS, BUILDERS, AND ARCHITECTS.

JAMES BOYDELL, 54, THREADNEEDLE-STREET, having been a very large manufacturer of machinery and irregular shaped iron, and having accomplished the rolling of some descriptions of the latter, thought by many to have been impracticable, will be happy to ASSIST any ENGINEERS, SHIPBUILDERS, and ARCHITECTS, in the planning of the details of what IRONWORK they may have occasion for, or bringing to perfection any invention in machinery, as well as procuring such materials for the purpose as they may require.

TO COAL, COPPER, IRON, CHEMICAL, and other MANUFACTURING COMPANIES.

TO BE LET, ON LEASE, for a term of years, as may be agreed on, a most extensive COAL-FIELD, of the first quality; FARM, of 240 ACRES of GRASS LAND, with a good commodious DWELLING-HOUSE and attached OFFICES, WALLED GARDEN, STABLING for 50 or 60 horses, from 20 to 30 WORKMEN'S COTTAGES and GARDENS, most eligible sites for the erection of Copper, Iron, Chemical, and other Manufactures, situate at Neath Abbey, in the county of Glamorgan, being close to the navigable river Neath, and only five miles from Swansea.

Mr. W. Hunter, at Briton Ferry, near Neath, will show the lands and coal; for particulars apply to Messrs. Adam Murray and Son, surveyors and land agents, 35, Craven-street, Strand, London.

STRUVE'S PATENT MINE VENTILATOR.

TO COLLIERY PROPRIETORS.

Quantity of air passed through a Mine almost unlimited, to the extent of 200,000 cubic feet per minute, if necessary—depending on size of apparatus.

No injury to pumps, tubings, chains, ropes, or pitwork.

Goaves kept clear.

Not influenced by barometrical and thermometrical changes in the atmosphere, or by wind.

Current of air undeviating.

LICENSES will be GRANTED on application to Mr. WILLIAM PRICE STRUVE, C.E., Swansea.

The ventilator has been erected at the Eaglesham Colliery, near Neath, and is perfectly efficient, and may be viewed on application to the proprietors, Messrs. Penrose and Evans, Neath.

CWMBRAIN PATENT IRON REFINERY.—The

PROPRIETORS of IRON FORGES and MILLS are respectfully INVITED to MAKE TRIAL of MR. BLEWITT'S REFINED IRON, or METAL, PREPARED by a

NEW PATENT PROCESS.

whereby the IRON is completely FREED from the IMPURITIES CONTRACTED in the BLAST-FURNACE, and, by judicious mixtures, rendered applicable to every kind of manufacture. Heretofore, the metal usually sold in the market has been produced from the worst pig-iron, and of some particular blast-furnace, or set of furnaces, without any mixture, or any regard to quality, or the purpose for which it might be required. The PATENT METAL IS PREPARED ON SYSTEM, and TO ORDER, for any of the following purposes:—

1. For BOILER and TANK-PLATES.

2. For PLATE-IRON, commonly called COKE-PLATES.

3. For STRONG CABLES, RIVETS, and ANGLE IRON.

4. For COMPOUND PUDDLED, best under the hammer into a bloom, reheated, and rolled into a 6 or 8 inch bar, makes TOPS and BOTTOMS for FLANCH and OTHER

RAILS, of very superior quality, and attended with less waste than any other kind of iron used for that purpose. It is also well adapted for nail-roads, horse-shoes, and for other ordinary uses of the blacksmith.

The PATENT METAL is marked with a squirrel, and the initials "R. J. B."

and is to be had only at the "Cwmbrain Iron-Works," near Newport, Monmouthshire

PATENT TOUGHENED CAST-IRON.—Messrs. GARDEN

and MACANDREW beg to call the attention of Architects, Builders, Engineers, Ironfounders, &c., to the ABOVE DESCRIPTION OF IRON (Mr. Morris Stirling's Patent), which, after numerous trials, experimental and practical, is found greatly to exceed all other cast-iron in tensile and transverse strength, as well as in resistance to crushing forces. Several of the most extensive ironmasters have been licensed, and from them, or their brokers, the patent iron can be procured.

Messrs. GARDEN & MACANDREW have always a STOCK of this IRON in PIGS, and are ready to EXECUTE ORDERS to ANY EXTENT, on the shortest notice.

27, Queen-street, Cheshire, April 25, 1849.

EUROPEAN LIFE INSURANCE AND ANNUITY

COMPANY.

ESTABLISHED JANUARY, 1819.

Empowered by special Act of Parliament, 7 and 8 Vic., Cap. XLVIII.

COURT OF DIRECTORS.

THOMAS WHALLEY BOLTON, Esq., 4, Elm-court, Temple.

JOHN RIVETT CARNAC, Esq., 46, Devonshire-street, Portland-place.

JOHN GREATHED HARRIS, Esq., 25, Chester-street, Grosvenor-place.

HENRY H. HARRISON, Esq., 1, Percy-street, Bedford-square.

CHARLES HILL, Esq., 25, Hyde Park-square.

WILLIAM PAXTON JENNIS, Esq., Twickenham.

GEORGE LEE, Esq., 33, Crutched-church, and Garret, Surrey.

FREDERICK SILVER, Esq., 10, James-street, Buckingham-gate.

JOHN STEWART, Esq., 22, Portman-square.

GEORGE JAMES SULLIVAN, Esq., Melford Hall, Long Melford, Suffolk.

Capt. WILLIAM G. H. WHISH, R.N., 10, Chamberland-street, Hyde Park.

Every description of risk contingent upon life assured.

Four-fifths of the profits eventually appropriated as a bonus to holders of policies granted on the participating scale. The last dividend averaged from 10 to 37½ per cent. on premium received during the preceding seven years.

A table for insurers on the non-participating scale, at a reduced rate, has recently been computed.

Permission to proceed to, and reside in, the British colonies, or any country not lying within the 38d parallel of latitude upon payment for sea-risk only.

Age and state of health admitted.

Proposals may be passed daily.

Every information can be obtained on application to the secretary, at the office, No. 10, Chatham-place, Blackfriars, London.

GEORGE W. S. LAGO.

LONDON INDISPENSIBLE LIFE POLICY COMPANY,

INCORPORATED BY ACT OF PARLIAMENT.

ON THE PRINCIPLE OF MUTUAL LIFE ASSURANCE.

No. 31, LOMBARD-STREET, LONDON.

TRUSTEES.

John Campbell Renton, Esq., M.P., Richard Spooner, Esq., M.P.

Richard Mallin, Esq., Q.C., James Fuller Madox, Esq.

William Wilberforce, Esq.

This company is prohibited by their Deed of Constitution, duly registered in terms of the Act, from dispensing a policy upon any ground whatever. All questions as to age, health, habits, and other matters deserving of inquiry, prior to the contract being entered into, are held as finally settled, when the assured receives his policy.

Copies of the annual report, and of the annual meeting of the members, prospectuses, and schedules, may be obtained by personal, or written, application to the Head Office, or any of the agents.

ALEXANDER ROBERTSON, Manager.

TWELVETREES BROTHERS' IMPROVED WASHING

PREPARATION saves labour, time, trouble, and money. The COST of a FAMILY WASH will not exceed SIXPENCE. The time required one hour and a half. It imparts a beautiful whiteness to the linen, and is warranted not to injure the finest fabric.

This preparation is extensively used in families throughout the kingdom, and at nearly all the infirmaries, asylums, public institutions, and union houses.

No labour is required at the tub, and the clothes are saved through avoiding the hard rubbing of the old method.—Sold in bottles at 6d., 1s., and 1s. 6d.

SWANSEA HARBOUR.—The Treasurer is authorised to RAISE ON BONDS, secured on the revenue of the Swansea Harbour, bearing interest at the rate of 5 per cent. per annum, payable half-yearly, at Swansea or in London, at the option of the holder, any SUMS not less than £100, nor exceeding in the whole £10,000, being part of the sum of £15,600 required for the works of the Corporation Quay, necessary to complete the floating of the town reach.

Application to be made to the Treasurer, at the Glamorgan Bank Company's office, Swansea.—Reference for any further particulars may also be made to Messrs. Rowland, Haco, and Rowland, solicitors, 38, Threadneedle-street, London.

LOANS ON DEBENTURES.—The CALEDONIAN RAILWAY COMPANY are prepared to RECEIVE TENDERS OF LOANS, in sums not less than £500.—Applications to be made or addressed to this office.

125, George-street, Edinburgh, May 30, 1849.

D. HANKIN, Treasurer.

TO COALOWNERS, MANUFACTURERS, CONTRACTORS, AND OTHERS.—STEAM-ENGINE FOR SALE.

TO BE SOLD, BY PRIVATE CONTRACT, a CONDENSING BEAM ENGINE, of 100-horse power, suitable for drawing coals, hauling waggons, or pumping water. The engine is quite new, having never been erected.—Address Mr. Thomas Murray, Chester-le-Street, Fence Houses, Durham.

STEAM-ENGINE FOR SALE.—TO BE SOLD, BY PRIVATE CONTRACT. an 85-inch cylinder STEAM-ENGINE, 10-feet stroke, equal beam.—Application to be made to Messrs. Hocking and Lonn, engineers, Rodruith.

DEVON AND COURTENAY CONSOLS.—PERSONS desirous of DISPOSING of their SHARES in these MINES will please send their lowest price to Messrs. JOHN T. TEAGUE & CO., mine sharebrokers, No. 4, King-street, Truro, Cornwall.

MR. EVAN HOPKINS, C.E., F.G.S., CONSULTING ENGINEER AND INSPECTOR OF MINES.

May be CONSULTED DAILY (by letters) on all subjects connected with MINING PROPERTY, both Home and Foreign.

BARRINGTON-ROAD, BRISTOL.

MR. C. S. RICHARDSON begs to announce that he has REMOVED his OFFICES from Whitefriars-street, Fleet-street, to

15, OLD BROAD-STREET, CITY.

MR. GEORGE BATE, JUN., CIVIL ENGINEER AND SURVEYOR, WOLVERHAMPTON.

N.B.—UNDERGROUND MINING SURVEYS accurately executed.

MINING PROPERTY.—MR. JAMES HERRON, MINE AGENT, 33, CLEMENTS-LANE, LOMBARD-STREET, has received instructions to DISPOSE of SHARES in FIRST CLASS MINES, paying regular dividends, and yielding to the purchaser from 17½ to 25 per cent. upon his outlay. He is also in a position to transact business in the following—viz.: Guadalupe, Kowick, Rhymney Iron, St. John del Rey, Treleighs, Tamar, East Tamar, Mary Ann, Treleagh, Llanbush, West Caradon, South Tolgus, East Wheel Rose, Condorruw, West Buller, Great Devon Consols, West Seton, North Pool, and Callington Mines.

A STURIAN MINING COMPANY.—Notice is hereby given, that all SHARES in this company on which the CALL, due on the 1st day of March last, has NOT BEEN PAID, were this day DECLARED FORFEITED for non-payment of calls.

By order of the board, K. MACKENZIE, Secy.

Offices of the Company, 9, Austinfriars, June 8, 1849.

A STURIAN MINING COMPANY.—Notice is hereby given, that the ANNUAL GENERAL MEETING of the registered proprietors of shares in this company will be HELD on Saturday, the 30th day of June inst., at the company's offices, No. 9, Austinfriars, for the purpose of receiving the directors' report, and transacting other business.—The chair will be taken at Two o'clock precisely.

By order of the board, K. MACKENZIE, Secy.

Offices of the Company, 9, Austinfriars, June 15, 1849.

ROYAL SANTIAGO MINING COMPANY.—The directors

herewith give Notice, that the ANNUAL GENERAL MEETING of the shareholders will be HELD at the office of the company on Wednesday, the 11th of July next, at One o'clock precisely, when the directors will make their report.

38, Broad-street-buildings, June 22, 1849.

TAMAR SILVER-LEAD MINING COMPANY.

THIRTEENTH DIVIDEND.

Notice is hereby given, that a DIVIDEND of TEN PER CENT. has been declared by the directors upon the paid-up capital of this company, PAYABLE on Wednesday, the 11th proximo, and succeeding Wednesdays, between the hours of Twelve and Four. The certificates are required to be left at the office two clear days, in order to be examined and marked.—44, Finsbury-square, London, June 21, 1849.

EUROPEAN GAS COMPANY, London, June 19, 1849.

Notice is hereby given, that the ANNUAL GENERAL MEETING of the proprietors will be HELD on Thursday, the 5th day of July next, at the hour of Two o'clock precisely, at the office of the company, No. 38, Finsbury-circus, London, pursuant to the provisions of the Deed of Settlement. Two directors retire by rotation, but, being eligible, will be proposed for re-election.

By order of the board, J. B. GREAVES, Secretary.

LYNVI IRON COMPANY.—Notice is hereby given, that the ANNUAL GENERAL MEETING of the shareholders of this company will be HELD at their offices, 15, Old Jewry Chambers, on Monday, the 25th inst., at Twelve o'clock precisely.

By order of the board, F. W. GIBBON, Secretary.

London, June 16, 1849.

ASSAYING AND ANALYSIS.—MR. MITCHELL

begs to inform the MANAGERS, &c., of MINES, SMELTING-WORKS, and MANUFACTURES, that he still continues to CONDUCT ASSAYS and ANALYSES of all PRODUCTS, metallurgical and manufacturing, at his LABORATORY,

23, HAWLEY-ROAD, KENTISH TOWN, LONDON.

to which address communications are to be forwarded.—Instruction in all branches of assaying and analysis as usual.

WIRE ROPE.—The Undersigned beg to inform the public,

that they have become SOLE LICENSEES of MR. ANDREW SMITH, for the MANUFACTURE and SALE of his PATENT WIRE ROPE; and having fitted their premises with his very superior improved machinery, have only to assure those who may favour them with their orders, that the same care and attention shall always be bestowed which they have reason to believe, has secured them such general approval.

LIGHTNING CONDUCTORS, SIGNAL CORD, and SASH LINE, always in stock.

WILKINS & WEATHERILL.

Patent Wire Rope Works, No. 39, High-street, Wapping.

DUISBURG IRON-WORKS AND MINES,

IN WESTPHALIA, CLOSE TO THE RHINE.

Managed in England according to the principles of the "Cost-book System," and in Prussia as a Société en Commandite, under laws limiting the liability of the shareholders to their personal subscription.

Company's Offices, 28, Moorgate-street, City.

GROWA SLATE COMPANY,

TREVAALGA, CORNWALL.

6000 parts, or shares, of £5 per part, or share (all paid), whence 2300 parts, or shares, are offered to the public.

NOW IN WORK ON THE "COST-BOOK" PRINCIPLE.

The QUARRY is situated on the CLIFFS, within one mile of the port of Boscawen—vessels load at the quarry during three-fourths of the year.

Transactions of Scientific Bodies.

MEETINGS DURING THE ENSUING WEEK.

THIS DAY	Royal Botanic—Inner Circle, Regent's Park	8 P.M.
MONDAY	Geographical—3, Waterloo-place	8 P.M.
TUESDAY	Medical and Chirurgical—33, Brompton-street	8 P.M.
	Civil Engineers—25, Great George-street	8 P.M.
	Zoological—11, Hanover-square	9 P.M.
WEDNESDAY	Society of Arts—Adelphi	8 P.M.
THURSDAY	Royal Society of Literature—St. Martin's-place	8 P.M.

ROYAL INSTITUTION.

The eighth and concluding lecture of Prof. Faraday's course was delivered on Saturday. Atmospheric electricity was the branch of the subject reserved for this occasion, which was rendered more than usually interesting by the practical application of the science in the consideration of the grandest phenomena of Nature. At the commencement of the last century, when little was known of electricity, it had been conjectured that lightning and electricity were identical, but it was not till 1752 that the fact was established by Dr. Franklin, who, by means of a kite, was enabled to draw electricity from the clouds. To illustrate the condition of a thunder cloud, a large bundle of long strips of paper, fastened together at one end, was suspended at the top of the lecture room, and it was electrified by means of a wire connected with the prime conductor of the machine. The strips of paper, apparently repelled from each other, stood out in all directions, and after the action of the electrical machine had been continued for some time, the strips continued in a state of repulsion, even when the prime conductor had been completely discharged, the air in the upper part of the room having become charged by electricity emitted from the ends of the paper, which acted in this respect like so many points. The electrical state of the air was proved in a very curious manner. A piece of cotton wool, steeped in spirits of wine, was attached to the end of a very long fishing-rod, and set on fire. From the flame a wire ran down the rod, and was placed in connection with the electrometer, and when the flame was elevated to the upper part of the room it attracted the electricity with which the air was charged, and caused the gold leaves of the electrometer to diverge. The electricity in one part having been thus withdrawn, the flame was moved to another part with a similar result. As the strips of paper which were employed to represent a thunder cloud repelled each other with great activity, it might be supposed that a cloud, when electrified, would be dispersed by the repulsive power, but Prof. Faraday observed, that the repulsion of the papers was only apparent, the real cause of their separation being the attraction of the walls and of the ceiling around them, and that if they were in the air, with no solid bodies around, they would all be attracted solely towards the earth—the superior attractive power would overcome all other attractions, and they would be kept together. It is in this manner that the particles comprising a thunder cloud are prevented from being dispersed by the repulsive power which bodies similarly electrified seemed to exert. In alluding to the appearances of a flash of lightning, the Professor remarked that its course is never in a straight line, but branches out in the same way that a long spark from the electrical machine does; and though many explanations of this phenomenon have been offered, among them the resistance of the air, yet no cause has been assigned for it which is satisfactory to him. Even the cause of the electrical condition of the upper regions of the atmosphere has not, to Professor Faraday's opinion, been satisfactorily explained, for though evaporation by some, and different states of temperature by others, have been adduced as the cause, he thought it was better to admit ignorance than to mislead by unsatisfactory explanations. The long-continued peals of thunder resulting from one instantaneous flash of lightning had been for some time a difficulty, but the difficulty vanished, when it was considered that a flash of lightning may pass through one or two miles, and that sound travels comparatively slowly; so that the sound caused by the disruption of the air at the commencement of a flash of lightning cannot reach the ear until several seconds after the first peal of thunder has been heard. The identification of lightning with electricity has enabled us to place the force of lightning under control, and to conduct it safely to the ground, though in carrying into effect this principle, serious mistakes are frequently made by not having the conductors continuous. The destructive effects that may be produced by the smallest disjunction of the conducting wire, were illustrated by several experiments, and even when good continuous conductors are used, considerable danger may arise if they be not sufficiently large. An exemplification of this effect was given by connecting a wire from the prime conductor with several metallic articles in its course to the earth, and though in this arrangement the sparks were passing freely through the wire, a jet of gas was inflamed on being brought near the metallic bodies with which the wire was connected. The influence of induction was shown in a striking manner by mounting a very large metallic globe on an insulated stand, several feet distance from the electrical machine, and whilst sparks were being taken from the conductor, by a ball held near it, the electricity induced in the globe was sufficient to fire a jet of gas. The importance of taking into consideration the influence of induction, when in operation on the large scale of nature, becomes, therefore, the Professor observed, very apparent, and it is of the utmost consequence, it should be borne in mind in the construction of powder mills, or of other buildings where inflammable materials are contained. In his concluding remarks, Prof. Faraday adverted to an allusion he had made at the commencement of the course, to the increasing infirmities of age, and the probability of his resigning; but he said he had met with so much indulgence during the delivery of his lectures, that so long as that indulgence was continued, he would not separate from them. This announcement was received with loud and hearty applause.

INSTITUTION OF CIVIL ENGINEERS.

JUNE 19.—JOSEPH FIELD, Esq. (President), in the chair.

The paper read was "On the Employment of High-pressure Steam, working expansively, in Marine Engines," by Mr. John Seward, M. Inst. C.E.

This communication was described to be the substance of a reply, by the author, to some questions addressed to several eminent engineering firms, by the Hon. H. L. Corry, M.P., when secretary of the Admiralty. This reply was found to furnish so much useful information, and so completely to open the question of the advantage or disadvantage of using high-pressure steam, and of cutting off the steam at various portions of the stroke, that it was conceived it would be advantageously produced at the institution, in order that the subject should be fully discussed. Unfortunately, the absence of the principal members at the floating of the first tube of the Britannia-bridge frustrated the latter expectation, but the substance of the paper appeared to be fully appreciated. The argument was so continuous that it would be difficult to attempt to do more than to give a faint idea of it, as the limits of this account would not suffice for an abstract of it. It first reviewed the mode of working marine engines for some years past, and noticed the gradual change that had occurred, particularly the tendency to use high-pressure steam, instead of that of a pressure of about 4 lbs. above the atmosphere. It then examined the system of cutting off the steam at various parts of the stroke; and as, at the same time, a remarkable augmentation had occurred in the speed of the vessels, which was naturally attributed to that cause, it inquired minutely into these several causes and effects, as well as the considerable reduction in the consumption of fuel which took place, enabling the vessels, consequently, to make longer voyages, or to carry less fuel for given distances.

In this examination, all the arguments for and against the use of high-pressure steam, and the presumed gain or loss of mechanical power in the use of the expansion principle in the cylinder, were canvassed at length; and the paper wound up with replies of the author to the three questions from the Admiralty, to this effect:—"The highest pressure of steam that we have, in any case, put upon a marine boiler of our own construction, was about 16 pounds to the square inch; but we are not inclined to repeat the experiment, as we feel assured that we can obtain equally good results with steam of a lower pressure—from 10 to 12 lbs. is the usual pressure we employ in the merchant service for engines and boilers of comparative small power. The steam pressure at present employed in the service is about 8 lbs. per square inch. We consider steam of this pressure to be well adapted for the exigencies of the service; we believe it is calculated to secure all the important advantages of power, economy of weight and space, in a very eminent degree; these advantages will, in some respects, be slightly increased by augmenting the steam pressure to 10 or 12 lbs. to the square inch. We strongly recommend that the steam employed in the navy should not be of greater pressure than 10 lbs. per square inch, or in extreme cases 12 lbs. to the square inch; any material increase to the latter pressure will be attended with considerable risk, without any adequate advantage."

In the discussion which ensued, these propositions were, to a certain extent, concurred with, but with limitations as to the introduction of other forms of boilers; and it was explained that the arguments of the paper were only applicable to condensing engines working expansively, and, therefore, left the question of the introduction of the use of high-pressure non-condensing engines quite untouched, and free for discussion at a future period.

It was announced that the paper to be read at the meeting of Tuesday, June 26th, was "On the Ratio between the Strength of Rails and the Weight and Speed of Locomotive Engines," by Mr. G. W. Buck, M. Inst. C.E., when also, being the last of the session, the ballot for members would take place.

ANTIQUITY OF THE NEWCASTLE LEAD TRADE.—In 1167, the Sheriff of Northumberland paid 18l. 14s. 1d. for the freight of the King's lead from Newcastle to Caen; and there is an entry in the Northumberland Pipe Rolls to the effect that 8l. was paid in the year 1079, for procuring ships to carry from Newcastle to Rochelle the lead which the King had given to the church of Clervall.

THE "GREAT BRITAIN."—We understand that this vessel has been purchased by Mr. Collins, of London, for 20,000l., and that he has contracted, at a further expense of 22,000l., to have her fitted out for sea. She is to ply between this port and New York.—*Liverpool Mail.*

The Public Works of England.

No. III.—CALEDONIAN CANAL.

The whole progress of the Caledonian Canal is so entirely illustrative of the conduct of public works in this country, that a detailed account of it would not be undesirable.

The Act for the purpose, which passed on the 27th Dec., 1803, granted to the Government the sum of 20,000l. for the undertaking. The engineering and conduct of the canal was entrusted to Telford, but the commissioners appointed another eminent engineer—Mr. Jessop—to survey the line and calculate the cost. The estimate of these gentlemen for the whole work was 474,000l., exclusive of the price of land, which expense, they supposed, would not be considerable—many proprietors having offered their land gratuitously, and the general value of land in the country through which the canal passed not being great. The expense for the first year was calculated at 75,000l. Before the close of the year docks on both seas were in a considerable state of forwardness; they were set out at 400 yards in length and 70 in breadth: 400 boats of oatmeal (56,000 lbs.) were lodged in storehouses, and delivered to the workmen at prime cost; 150 persons were set to work, besides persons making and repairing utensils—a number in those days thought very great, though a railway engineer would smile at it. The average wages to the workmen was 18s. 4d. a day. Fir was cut down on the spot or in the neighbourhood, costing from 10d. to 14d. the cubic foot—imported timber would have been twice as dear, and answered no better. Thus the preparatory arrangements were begun with much forethought and economy.

The salary of the engineer, Mr. Telford, was at the rate of three guineas per diem, including travelling expenses, with some allowances for the expenses of one or two lengthened journeys. This sum would make Mr. Brunel stare. The salaries of the superintendents were fixed at from 50 to 150 guineas per annum. The valuation of the land was about 15,000l.

Great apprehensions were entertained that the nature of the soil would interpose insuperable difficulties. Mr. Jessop's report, in the actual state of geological knowledge, is curious. "It seems (he states) probable that in some early age of the world the immense chasm, almost two-thirds of which is still occupied by water, has been nearly (why did I not say quite) open from sea to sea, and that the land which now separates the locks has been formed from the decay of the adjoining mountains. The decay is very apparent in Ben Nevis, which is evidently a part only of a much greater mountain which seems to have included the present one and two adjoining mountains of lesser height. Impressed with this idea, I was very apprehensive, after the first trials of the ground at Inverness, that many other parts would be found similar to it. That greatest part of the land there being composed of gravel and sand, is so open that the water in the pits sunk and rose with the tide. Fortunately, a place has been discovered where a foundation on clay may be got at by surrounding the pit with a cofferdam." It was found generally that the gravel and sand had a sufficient admixture of earth to exclude water.

The width of the locks was calculated at 38 feet, length in the chamber 152 feet: 33 locks were provided for, at an estimate of 171,327l., and as many bridges at an estimate of 34,000l. The common cutting of the canal was estimated at 142,000l., the depth being 30 feet, with a bottom of 50 feet—a slope of 18 inches to a foot, and 90 feet width at the surface. The remainder of the estimate was for deepening rivers, cofferdams, aqueducts, culverts, with a sum of 15,000l. for steam-engines.

By the time the canal had passed, the usual late attended these estimates. It was found that the locks would be too small, as frigates of 44 guns might be required to pass—the length was extended to 185 feet and the breadth to 43, with an addition to the estimate of 129,244l. Then side locks were required for small vessels, to save the wear and tear of the large locks; these were further estimated at 75,000l. Iron railways were constructed for the purpose of conveying stone from the quarries opened in the vicinity of the canal—one of them 11,000 yards, a great length in those days for such a purpose. The number of labourers was increased from 150 to 900. The greatest difficulty was encountered in the erection of the sea locks, in the construction of which a good deal of ingenuity was exhibited.

In addition to the increase of other estimates, the salaries, as usual, were increased. Two resident inspectors were appointed, and several other officers, at allowances of upwards of 200l. yearly each. Far more trouble and expense than was anticipated occurred in the valuation of land, which the proprietors did not seem disposed to part with gratuitously, nor at other than a high value.

By great improvement in the usual practice of canals was introduced at the very commencement of the undertaking in the construction of the bridges. On the Forth and Clyde Canal wooden drawbridges had been used at first, raised by chains and timber framings; as these were out, cast-iron bridges were substituted, raised by a wheel and pinion; but the Caledonian bridges were of iron, on the screw principle, which had been already used in the London Docks. One of the most important works in the early stage of the canal was the altering the courses of the rivers Ness and Oich. The beds of both of these rivers were required for the canal. The embanking necessary was very extensive.

In 1820 the first steamboat was employed on the canal by Mr. Henry Bell, the introducer of steam navigation into England, and the person who established the well-known steam-boats on the Forth and Clyde.

On the 23rd of October, 1822, the canal was opened from sea to sea with very great ceremony. The principal landlords along the land fired salutes and gave entertainments on the occasion, and the papers of the day describe the affair as one of great magnificence. The passage back, from west to east, was made in 13 hours. The depth of water was then only 20 feet, but the sailing machines were in active operation for the purpose of deepening the canal to 30 feet.

The entire term, from the commencement to the opening of the canal, was 19 years. It was begun in October, 1803, and opened, as we said, in October, 1822. The expenses to this time were 912,373l.—of this no less than 47,896l. was paid for land which was to have been granted gratuitously; 612,770l. was paid for labour, and did vast good to the country. The steam machinery, estimated at 10,000l., only cost 5566l., but the whole machinery cost upwards of 121,000l. The cost of management for the whole time averaged under 1500l. per annum. On the whole, and by comparison with modern undertakings, this great enterprise was conducted with extreme economy and great ability. At times the persons employed on the canal at one time amounted to above 9000.

In the first year of the opening 307 vessels entered the canal, of which 37 passed from sea to sea. This was then considered a favourable account. The tolls fixed were a farthing a ton per mile, with an increase upon very short voyages.

From May, 1823, to May, 1824, 275 vessels passed through the canal, but the expenses of maintaining the canal rose considerably. Nearly 300 workmen were employed on the works, and the tonnage duty was consequently doubled. The canal dues, previous to the increase, from the year quoted above, amounted to 1555l. Notwithstanding the increase the profits of the canal were small—more workmen were obliged to be employed. The increased tonnage drove the shipmasters to the circuitous passage of the Pentland Frith, though even now the duty on the whole passage was but 2s. 7d. per ton. One of the reasons for increasing the duty was the complaint of the proprietors of the Forth and Clyde Canal, who complained that the Caledonian, constructed at the public expense, entered into competition with them by low tolls.

Since that time no efforts have been able to make it a profitable one, though the Caledonian Canal, taking the circumstances of the time in which it was constructed into consideration, is a work of which the nation may be justly proud.

The mounds, which guard the entrance of the canal at the Beaulieu Frith, were advanced from the high water-mark to 4 fathoms deep of water; at the end is the sea lock. These immense works are 400 yards long, and took four years to construct. The settling of the vast bottom of mud and earth took two years; and the mounds of masonry which surround it, capable of receiving the largest merchant ships, is 170 feet long, 40 feet wide, and 30 feet deep. The other works throughout the canal are on a similar scale. At the entrance of the lakes, owing to the sponginess of the ground, great difficulties were surmounted by the perseverance of the engineer. The dredging necessary for excavation of such an extent was constructed with immense ingenuity. Neptune's staircase, which we have already mentioned as connecting eight locks in succession, contains 400 yards of solid masonry. A construction of the kind had never been attempted before.

On the whole, few works show more vividly the unflinching ingenuity and perseverance of the country than the Caledonian Canal.—*Daily News.*

Recipes.

[Continued from the Mining Journal of June 9.]

BLOOM OF ROSES.—Carmine dissolved in liquor ammonia, and diluted with rose water and spirits of wine.

BRAZIL WOOD LAKE.—Boil 1 lb. of Brazil wood in 4 gallons of water for 20 minutes; 1 lb. of alum dissolved in water, and 1 lb. of solution of tin, then precipitate with a solution of carbonate of potash or of soda, carefully avoiding excess of the alkali.

MADDER LAKE.—Macerate 2 parts of madder in 8 parts of cold water for a quarter of an hour, then put the madder into a cloth and press it strongly. Repeat this operation three times. The madder, after being thus exhausted of some of its colouring matter, is to be digested for three hours in a solution of 1 part of alum and 12 parts of water, with the heat of a water bath; the liquor is then to be filtered, and a solution of carbonate of soda added in small quantities at a time, to precipitate the lake.

BROWN PINK.—Boil 1 lb. of French berries, 1 lb. of fustic, and 1 lb. of pearl ash with 12 gallons of water, in a tinued or pewter boiler, for half an hour, and then strain while hot. Dissolve 1 lb. of alum in 24 gallons of water, and add this solution to the former, as long as any precipitate is formed. Collect, wash, and dry the precipitate.

ROSE PINK.—Whiting coloured with a decoction of Brazil wood and pearl ash. The colour is very fugitive. Alum or solution of tin is sometimes used to vary the colour.

ORANGE LAKE.—Boil 2 ozs. of annatto and 1 lb. of pearl ash in 1 gallon of water, for half an hour, then strain. Dissolve 1 lb. of alum in 12 gallons of water; add this to the former solution as long as any precipitate is formed.—*Patent Journal.*

SEPARATING THE SEED FROM COTTON.—We have already stated that a patent has been taken out by Mr. R. Burn, Edinburgh, for an improved roller gin, for separating seed from cotton previous to its being packed in bales, and we now only allude to the subject, to show how little the people of India thank machinists for troubling themselves about improvements to their primitive apparatus, or how unlikely it is that any such improved machines will be used there, although with proper cultivation and management it is probable, according to the evidence of Major-General Briggs, before the House of Commons, that India could produce sufficient cotton for the use of the whole world. From an extract from an Indian publication, we find that the foot roller is the only machine used in the Mahratta country, by which not more than 6 lbs. of cotton per day can be produced; while, in the Guzerat, the "churka" alone is used, being two rollers in a frame, turned by hand, by which from 20 lbs. to 40 lbs. per day can be thoroughly cleaned; and the writer concludes the article, by urging on the people of Liverpool and Manchester the advantages likely to accrue if the East India Company could be persuaded to give up at once and for ever the so-called cotton experiments, and leave all such business to our different scientific societies, to the mercantile community, and to the natives themselves. One of the directors of the Manchester Commercial Association has also recently received a letter, in which it states—"The native cotton, I am glad to say, is very good this season, and the weather has been favourable for picking, so that the whole of the crop has been well saved; but I fear it is but little cleaner from leaves and trash than heretofore, except in particular localities. But even in this article the local dealer will give no more for 'clean' than 'dirty,' and, consequently, the ryots take little trouble about it—so that I fear, until a certainty exists of a better price and earlier market, much improvement will not be made."

Rock salt is found in Cheshire at a depth of from 28 to 50 yards, and the beds are from 1 to 40 yards thick, separated by clay or slag stones; the colour is reddish, and it is so hard as to require to be blasted with gunpowder; the largest mine is 880 feet deep and 20 feet high, supported by pillars of the salt.

NOAD'S LECTURES ON ELECTRICITY.*

Among the numerous works published within comparatively a few years, on the interesting and fascinating science of electricity, none have, perhaps, met with a larger share of public approbation than the lectures of Mr. Henry M. Noad, the lecturer on chemistry at St. George's Hospital. We have received a volume of the third edition, just published by Messrs. Knight and Sons, Foster-lane, which we find greatly enlarged and improved over former editions, and is illustrated by nearly 300 wood cuts. These lectures comprise the entire theory and practice of galvanism, magnetism, electro-magnetism, magneto- and thermo-electricity, and an additional lecture is added, giving a general account of Matteucci on electro-physiology. For convenience of reference every lecture is divided into paragraphs, each being numbered—a plan now being very generally followed by scientific writers, and which greatly facilitates the reader in his researches. In his first lecture the author gives a history of electrical discoveries and researches from the earliest times to the present period. He states that, although occupying so prominent a place in modern science, electricity was quite unknown to the philosophers of olden times, and may be said to date its connection with physics about the beginning of the eighteenth century. In the writings of Pliny and Theophrastus some remarks occur on the attractive power of amber and lyncurium stone when rubbed, for light substances, but no attempt to explain the property is made. In the year 1600 Dr. Gilbert published a work on magnetism, in which he mentions several new facts attributable to electrical agency, and greatly increased the number of substances capable of acquiring electrical properties. This drew the attention of philosophers to the subject, and in 1730 the true foundation of electricity was laid by Stephen Grey, a pensioner of the Charterhouse, who, impelled by enthusiasm, engaged in a course of experimental researches, in which some general principles, producing important effects on subsequent investigations, were developed. His principal discovery was, that all substances were divisible into two classes, electric and non-electric, the latter acquiring the electric state by contact with the former when excited by friction. He also discovered the insulating property of silk, resin, glass, hair, &c. DuRoi discovered the existence of the two distinct kinds of electricity, vitreous and resinous; the former that of glass, rock-crystal, precious stones, hair and wool of animals, and many other bodies, and the latter that of amber, copal, gum-lac, silk thread, paper, and a vast number of other substances. He described these bodies as having the same kind of electricity, repel each other, but attract substances charged with the opposite electricity. The Germans soon followed their attention to the science, and under Boze, Winkler, and Gordon, the electrical machine assumed a form nearly identical with the cylindrical ones of the present day. In 1747, in consequence of a communication from Mr. P. Collinson, a Fellow of the Royal Society, to the Literary Society of Philadelphia, Franklin first directed his attention to electricity, and from that period, to 1754, his experiments and observations were embodied in a series of letters, which were afterwards collected and published. His hypothesis was, that all bodies in their natural state are charged with a certain quantity of electricity; if it possesses more than this quantity, it is ready to give up the surplus to any substance having less, and if it has less than the definite quantity, it will take from any body in a natural state a portion of its electricity, dividing it equally, so that each has less than the natural amount; to these he gave the names of positive and negative—a body having more than its natural quantity being the former, and less the latter. One electric fluid is thus supposed only to exist, and all electric phenomena are referable either to its accumulation in bodies in quantities more than their natural share, or to its being withdrawn from them, leaving them minus electric excess representing the vitreous, and a deficiency the resinous, states of electrical agency. He also discovered the similitude of artificially developed electricity to the lightning. In the year 1785 the foundation of electro-statics was laid by Coulomb, who brought this most subtle of all physical agents to the vigorous way of mathematics, and caused it to become a branch of mathematical physics. He established the existence of three valuable properties in the science—viz.: 1. That electric forces, attraction and repulsion, vary inversely as the squares of their distances. 2. That electric bodies, when insulated, gradually lose their power, the surrounding atmosphere never being free from conducting particles, and from the incapacity of the best insulators to retain the extra charge, there being no known substance altogether impervious to electricity.—3. That the electricity is accumulated in a body, and never penetrates the interior, a thin hollow sphere containing as much as a solid of the same size. The author then proceeds to illustrate the primary phenomena of electricity, with a description of all the known experiments of any importance with the machine, Leyden jars, &c.; and, through the whole of these lectures are depicted with the most interesting and powerful nature, and a full exposition of all the known phenomena of this mysterious and powerful agent. We shall close these remarks with a description of Mr. Crose's magnificent mechanical arrangements for collecting atmospheric electricity, and shall give some further extracts from the work in future numbers.

"Of all the individuals in this country who have distinguished themselves by their researches in atmospheric electricity, Mr. Crose, of Broomfield, near Taunton, stands foremost. This gentleman, who, from a modesty which is inseparable from true philosophy, he rarely writes the name of his country, has devoted more than thirty years of his life to a close investigation of the science of electricity, and his experiments have been carried on on a scale, and conducted with a degree of skill, which have astonished every one who has had the good fortune to witness them. With a liberality that is truly gratifying, Mr. Crose has not only permitted me to make a minute inspection of the whole of his magnificent arrangements, but has favoured me with written details of some of his observations, which, with his permission, I gladly take the present opportunity of presenting to the public."

Mr. Crose collects the electricity of the atmosphere by means of wires supported and insulated on poles fixed on some of the tallest of the magnificent trees which ornament his grounds. As far as the eye can reach, these poles may be seen, though at present, in consequence of some extensive damages which happened during a late violent storm, there are not more than 1600 feet of wire insulated. The wires are insulated on the poles by means of funnels; they are made of copper, about 44 inches in diameter, and 11 inches in length, and into a cavity or socket of about 2 inches deep, formed at the close of the funnel, is inserted a stout glass rod of sufficient length to reach to the open end of the funnel, where it is mounted, by means of a strong cement, with a metallic cap and staple. The latter appendage receives the hook of a very strong wire, which passes through a circular plate of copper, placed about four inches from the mouth of the funnel, and terminates in a hook, to which one end of the exploring wire is fixed. The object of the metallic disc is to preclude the admission of snow, rain, &c., and thus to preserve the glass rod in a dry insulating condition. These funnels are easily raised to the tops of the poles by an arrangement of pulleys and thus the wires are supported at intervals of 100 feet, and by means of a screw, the brass ball with which it is terminated may be adjusted at any required distance from the opposed brass ball of the conductor. Another most important piece of apparatus is a lever furnished with an insulating handle by means of which the current of electricity, when too strong, or when no experiments are in progress, is easily directed into the earth outside the window, and without entering the room."

* Lectures on Electricity, comprising Galvanism, Magnetism, Electro-magnetism, Magneto- and Thermo-Electricity, and Electro-physiology. By HENRY M. NOAD, lecturer on chemistry at St. George's Hospital; author of "Lectures on Chemistry," and of the treatise on "Chemical Manipulation and Analysis" in the "Library of Useful Knowledge." London: George Knight and Sons, Foster-lane.

Past and Present Views of Railways, by ALEXANDER GORDON, M.I.C.E. London: W. H. Dalton, Cockspur-street.

The author of this pamphlet has, ever since the introduction of the railway system, held opinions, and written in accordance with them, totally adverse to its introduction and progress—a system which he states "has been established by unprecedented monopoly, maintained by millions of money, and is now tottering to its fall, because people find that they have not only been disappointed, but desperately duped." By means of such opinions, we cannot expect anything very favourable about railways; yet, although we cannot accede to the correctness of some of his conclusions, we must do him the justice to say, that his statements are founded on facts; and while they clearly show the erroneous views which for years have been taken, and the glaring faults and frauds committed, we cannot subscribe to his ideas of the alarming position of shareholders, and the even national ruin which he appears to contemplate must accrue from the introduction and continued support of the present system. The system we do not continue to be supported as it has been, but must be, and is being, gradually reformed and improved.

Statistics of Railways.—Part I.—The Brighton Group. By JOSEPH MILLER, public accountant, Newcastle-upon-Tyne, several years secretary to the Great North of England Railway. London: Simpkin, Marshall, and Co.

This work is intended by its author to form a permanent record of the financial history and comparative statistics of the railway system. The author states that the tables are chiefly compiled from the published reports of the several companies, and from information obligingly supplied by the officials. As almost every company has its own peculiar form of accounts, so different in arrangement from the rest, his object has been to combine their various excellencies without incongruity, and to give the means of fair comparison, without note or comment. Although a very elaborate work has lately been before the public from the pen of Mr. Harry Scrimgeour on the same subject, we think there is room for Mr. Miller's work, which, from its conciseness, will prove an excellent book of reference to all interested in railway matters. It consists entirely of tabular matter, showing the powers of each company and the works undertaken, the general balance-sheet, particulars of capital received and expended, half-yearly traffic and disbursements, with notes explanatory of any items which appear unintelligible. Being published in numbers and parts, renders it obtainable by all classes of persons who are not in a position to purchase the whole, and, when bound complete, will form a handsome and useful volume.

LIQUID GLUE.—VARNISH REQUIRING NO SIZE.—In the Mining Journal of the 9th December last, we noticed a liquid glue introduced by Mr. Neuber, now of New Oxford-street, which will not mix with water, and is consequently impervious to moisture, and remains unaffected in damp situations; it is incombustible, and free from the slightest smell. This glue was of a dark red colour, but, after a variety of experiments, Mr. Neuber has succeeded in producing a glue which has scarcely more colour than cream, dries quickly, and with an adhesiveness and tenacity far superior to common cements. This glue will effectively repair china, glass, earthenware, marble, and almost any substance. We have tried it on china, and, after remaining about 10 days to get completely set before use, it will stand hot or boiling water as well as a sound cup. It is necessary to well warm the materials to be mended, and a successful result will be obtained. The dark glue previously mentioned, is not only applicable to wood, but also to stone, marble, &c. It is now in use in many carpenters, joiners, and cabinet makers' shops; and as it requires no preparation, and can be supplied at a cost almost as low in proportion as common glue, we should expect it will obtain for the inventor a still greater share of public patronage than he has already obtained for his former production, which has been highly satisfactory. Mr. Neuber has also introduced a varnish for paper-hangings, and other materials which require no previous preparation of size, but it may at once be laid on with a varnish brush in the usual way. It is perfectly waterproof, can be washed as often as required, will take renewal coats when worn, is free from smell, gives a beautiful gloss, and is unaffected by changes of temperature or a damp atmosphere. The inventor is also now preparing a clear and colourless varnish, of the same character, for maps, engravings, drawings, &c., which will not discolour the most delicate paper.

Proceedings of Public Companies.

MEETINGS DURING THE ENSUING WEEK.

THIS DAY Law Life Assurance Company—offices, at Twelve.
 MONDAY Lynvi Iron Company—offices, at Twelve.
 Bank of Australasia—offices, at One.
 TUESDAY South Australian Banking Company—offices, at One.
 County Fire Insurance Company—offices, at Twelve.
 Norwich Union Reversionary Interest Company—offices, at One.
 Wednesday Balance Mining Company—offices, at One.
 South Australian Company—offices, at One.
 Providence Life Insurance Company—offices, at Twelve.
 Royal Exchange Assurance Company—offices, at Twelve.
 Thursday Marine Insurance Company—offices, at One.
 Norfolk Railway—offices, at One.
 Royal Polytechnic Institution—offices, at One.
 Friday Promoter Life Assurance Company—offices, at Twelve.
 Saturday Astorian Mining Company—offices, at Two.

[The meetings of Mining Companies are inserted among the Mining Intelligence.]

THE LONDON INDISPOTABLE LIFE POLICY COMPANY.

The first annual meeting of this society was held at the London Tavern, City, on Friday, the 15th inst., for the purpose of receiving the report, and for the election of directors.

JOHN DANGERFIELD, Esq., having taken the chair, said that by their deed, as well as in compliance with the Joint-Stock Companies' Act, they were obliged to hold a meeting within one year of the origin of their establishment. The past year was a broken one, and the meeting would perceive that the report embraced only 11 months, commencing on the 30th June, 1848, and terminating on the 1st June, 1849.

Mr. ALISON (the secretary) informed the members that there had been 61 meetings of the board since the commencement of the company.

The following report was then read to the meeting:—

The directors have great satisfaction in laying before the meeting the balance sheet and statement of the affairs of the company, from the commencement of business to the 31st December last, prepared in compliance with the directions contained in the Deed of Constitution and the Act of Parliament under which the company is incorporated, approved by the board, and examined and certified by the auditors; and also an account and balance sheet taken on the 1st of the present month, from which it appears that, after providing for the payment of the sums assured, and all out-standing debts, including preliminary charges, there is a balance of profit of 11,919, 19s. 11d., which belongs to, and will be divisible with, the future profits, as directed by the Deed of Constitution, exclusively among the present and future assured members of the company. In the course of the 11 months embraced in these accounts, 253 proposals of assurance have been submitted to the board, 227 policies have been completed and issued, assuring the sum of 73,101, and yielding, in annual premiums, a revenue of 2904, 15s. 10d. With such results, your directors congratulate you on the introduction of that principle of indisputability and enlarged liberality in practice, to which they attribute that amount of success, which is almost unexampled in the history of mutual assurance, and which would, probably, have been even greater, had the company commenced business in a year less unfavourable than the last to the progress of general business and the extension of life assurance. Having founded the company upon a principle altogether new as applicable to life assurance—which affords to the public increased protection, by substituting the certainty for the probability of payment of policy claims—your directors have attentively, and with much interest, marked the gradually increasing progress from the commencement of business to the present date. They have seen the peculiar features and practice of the company pointed out and advocated with that earnestness and ability, which the English press is in the habit of applying to improvements affecting the general welfare; and they have experienced much satisfaction from observing that the largest assurances on the books have come from solicitors of well-known prudence and high standing in their profession, whose duty and chief object is the protection and benefit of their clients. It appears from the balance sheet, that a considerable amount has been paid by this to other companies, for the partial re-assurance of policies exceeding, by several thousand pounds, the extent of risk considered prudent for the present to be retained. These are matters of much gratification, and they augur enlarged prosperity; yet it should be borne in mind, that even greater returns may be obtained by increased exertion on the part of those interested in the advancement of so beneficial an institution, in the wide field of uninsured lives; and your directors would remind you that in mutual life societies, as there are no shareholders to detract from the profits, there are no proprietors interested in furthering the business,—and that it is incumbent on every assured member of a mutual company to employ his influence in extending its operations, whereby he will not only essentially promote his own individual interest, and benefit his co-assured, but add to the comfort and permanent welfare of every friend and acquaintance whom he may induce to become a member.

The CHAIRMAN, in moving the adoption of the report and balance-sheet, said, that it would be seen from the documents read, that they had assured to the extent of 73,101, and that the annual premiums derivable therefrom was 2904, 15s. 10d. This society had been formed, as mentioned in the report, on a principle that was entirely new, which was the indisputability of its policies. They all knew, perhaps, the great inconvenience that attended private individuals who were desirous of assuring their own lives, or those of other persons, and the serious losses that frequently arose from assurance offices disputing their policies. His opinion was, that in all contracts both parties should be equally bound, and that if such a principle was a true one with regard to other contracts, he saw no reason why it should not exist in respect to contracts affecting life assurance. Numerous persons had entertained the same opinion before the establishment of this office, and on its commencing business on the indisputable principle, they immediately came to assure their lives, saying it was the only office for the purpose, and such a one as the public ought to encourage. (Hear, hear.) He was happy to say, that their success hitherto had exceeded their most sanguine expectations, and fully confirmed his own belief at the very outset, that an office established on the indisputability of its policies, and being, at the same time, on the mutual principle, would not fail to meet with the public approbation. (Hear, hear.) The advantage of a mutual assurance was, that instead of paying its profits to proprietors, all the profits went to the assuring members, which, with the exception of the mere expense of management, the member could either receive in the shape of bonuses, or they might go to the reduction of the premiums on the policies. It was generally found that after four or five years the effect of these reductions on the original premiums would be about 25 or 30 per cent., and very often the reductions would amount to two-thirds of the amount. (Hear.) Since the 31st of December last, to which the balance-sheet was made up, they had gone on progressively, and it only remained for the members to exert themselves individually for the general welfare of the company.

Mr. BEVAN (banker, Bury St. Edmunds) said, his attention had been drawn to this society by the interest which a friend of his (Mr. Madox, one of the directors) had taken in its welfare. He saw in it great advantages to men of business; for instance, many country bankers, like himself, would often lend money, where it would become necessary to insure the lives of the parties. Now, a policy in that case was a thing of great advantage to him, whilst the borrower might be perfectly indifferent as to the success of the policy. He might care nothing about the truth of the allegations he was called upon to make, for he knew the risk would not fall upon himself, but upon the banker lending the money. (Hear, hear.) A case happened to him lately where the life of one of his debtors had been insured in an office which he thought was a perfectly secure one, and where the premiums had been paid for 15 or 20 years, but on claiming the amount he had to suffer a deduction from it to the extent of 100%. (Hear, hear.) When he heard of this company being established, and had been fully assured that its policies would not be disputed when once accepted, he immediately felt an inducement to make use of it himself, and introduce it to his friends, which he would continue to do whenever circumstances occurred. (Hear, hear.) The resolution was then passed unanimously.

R. H. Forman, John Hamilton, and James Fuller Madox, Esqrs., were then re-elected directors.

A resolution was then passed for increasing the number of the board to 12 directors.—Mr. Bramwell was elected a director.—Two of the auditors, Messrs. Turner and Cumming, were re-elected unanimously.

Mr. TURNER was happy to bear his testimony to the superior mode in which the accounts were kept by their excellent secretary, Mr. Alison. The auditors had found every voucher correct, and every item in the accounts clearly stated and satisfactory, which caused them not the slightest difficulty in their examination of the books. (Hear, hear.)

Mr. BRAMWELL moved a vote of thanks to the directors, which was seconded by Mr. KING, and passed unanimously.—Mr. BRAMWELL then proposed a vote of thanks to their manager and actuary, Mr. Alexander Robertson. (Hear, hear.)—The vote was agreed to unanimously.

The CHAIRMAN moved a vote of thanks to Benjamin Phillips, Esq., their medical adviser, to the auditors of the company, and to Mr. Alison, the secretary. He thought they were very fortunate in getting a gentleman of Mr. Phillips's great experience in his profession. (Hear, hear.) Their auditors were men of great business knowledge, and highly valuable to such a company. (Hear, hear.) As to the secretary, he could bear the testimony of the board to the excellent manner in which the accounts were kept by him, and to the satisfactory manner in which he had performed his duties since his connection with the society. (Hear, hear.)

Mr. A. ROBERTSON, the manager and actuary, returned thanks for the compliment paid to his services. He had cause to congratulate himself as well as themselves on the statements just read to the meeting. No doubt the establishment of any new insurance company involved considerable thought and anxiety. It had been said that there was no room for others; but he thought their opinion would be otherwise, if they only judged from one year's experience of this society; and that it would be admitted that there was room for one more company at least. (Hear, hear.) Looking at the balance-sheet, it would be perceived that they paid 177, for re-assurances to other offices—so that by advancing their own office, they did not, consequently, inflict any harm upon others. When a young office commenced, their object ought to be not only the welfare of their own society, but also the welfare of all others. The advantages of indisputability in policies could, in his opinion, not be reckoned too high; for he felt that there could be no complete assurance unless it were an indisputable one. (Hear, hear.) Mr. Bevan had stated his opinion, and pointed out the advantages of the principle to men of business and to professional men, who had to effect insurances on the lives of other persons; they must see the

advantages not only to themselves, but also to their clients. Solicitors applied to this office because the company undertook the trouble and risk attending the inquiries as to the health and habits of the life proposed, and thus relieved them of serious responsibility, and enabled them also to render their clients' debts completely secure. It had been said that the honour of boards formed the security of the assured. Now, he was not disposed to detract from the honour of gentlemen who undertook the duties of directors of life companies; it was not requisite, in proving the necessity which existed for the establishment of this company, to insinuate any want of confidence in individuals; but all knew how various were the views of well-principled men in matters affecting their interests; and surely if, in the ordinary affairs and transactions of business, contracts were made binding upon both parties, and nothing were left dependent upon the mere honour of the person who must ultimately become debtor to the other, life policies ought not to be placed in a more precarious situation, and left dependent for their validity upon the notions of right and wrong which a board may entertain in investigating a multitude of facts and circumstances which occurred at a remote period. Surely the requirements of justice were best complied with, by granting indisputable policies, whereby the rights and interests of the assured are placed in the secure and independent position to which they are entitled. (Hear, hear.)

Thanks having been voted to the chairman, the meeting separated.

HUTCHISON'S INDURATED BUILDING MATERIALS.

A case respecting this patent right came before Vice-Chancellor Knight Bruce, on Monday week, in which Mr. Hutchison, the owner of the English patent, was the plaintiff, and a M. Teychenne defendant. It appeared that Teychenne proposed to Le Goux, the inventor, to find him a purchaser of his secret, to be patented in England; and for that purpose a caveat was entered in their joint names. On defendant coming to London, he treated with plaintiff (Hutchison) for sale of only one-third of the patent right, for 1500*l.*; to complete which, the plaintiff proceeded to Caen, in Normandy, there joined Teychenne, and discovered that defendant had purchased the whole secret for 16,000 *frs.*, or 640*l.* only, which sum was agreed to be paid to Le Goux within a specified time, but which Teychenne failed to do. Le Goux being at liberty, treated with the plaintiff, and sold him the right to patent his invention for England, for a much larger sum; and in that interval, defendant being aware of the negotiation, proceeded to England, and secured a patent for Le Goux's invention, in his sole name, without any respect for the existing caveat, or to the acquired rights of the plaintiff.

Messrs. Cooper, Terrell, and Webster, for the plaintiff, contended that the defendant was merely an agent of Le Goux, and could only claim for his expenses and time.—Messrs. Russell and Hetherington argued that Le Goux had rescinded all previous understanding, and left the defendant his undoubted right to secure the patent in his own name.—His Honour was clearly of opinion that the plaintiff was entitled to sue, and that defendant had no title to the patent. Before deciding, he wished to know if any and what agreement existed between defendant and Le Goux; whether it had been abandoned or varied; and if so, when and under what circumstances? There should be liberty to examine Le Goux, *vis-à-vis*, in the Master's Office. His Honour thought it very likely the parties might come to some arrangement.

We shall notice the progress of this case, which will now no doubt be shortly settled, and give the result in a future Number; in the meantime, we are gratified to find that the indurated material for building purposes is making that steady progress which indicates its future complete success. The operations of the patentee hitherto have been rather by experiment to bring the subject successfully before the public, than with the view of immediate large returns; still he has executed, and is carrying out, considerable orders; and what insures its future profitable position is the fact that, wherever it is once employed, parties become so convinced of its superiority, its indestructibility, its imperviousness to wet or damp, and its great economy, that they resolve to use it in future, in lieu of any other description of stone in its native state. In houses where the damp is excessive, as may be seen by several feet of the brickwork upwards from the foundation being affected, the flooring of this material is perfectly dry and warm. Tunbridge Wells is undergoing great improvements, building is proceeding at an extensive rate, and, during the current summer, Mr. Hutchison will, we trust, have wide-spread opportunities for successfully introducing the Calverley Quarry sandstone, similar to what has hitherto been much used in the district; but which, in its natural state, holds the water like a sponge, and from the action of the atmosphere and frost speedily decays. The process under notice converts this into a substance of metallic hardness, totally impervious, and which can be supplied at a less cost than York or Portland stones. People are daily growing wiser; and the sanitary question is now the order of the day. We cannot expect builders to invest their money in perishable commodities, or people to live in damp houses, when this indestructible material is within their reach, and which will prove a sovereign panacea for these evils, so universally complained of.

ANCIENT MANUFACTURES OF IRELAND.—At the last meeting of the Royal Irish Academy, Sir Robert Kane made a communication, and exhibited some specimens taken from the Museum of Irish Industry, to which they had been presented by various parties at different periods, with a view to illustrate the products of the manufactures of Ireland, as carried on at a date of which there is not any positive record of existence, but which are known to have been carried on to an extensive degree in this country as recently as the reigns of Elizabeth and James I. Sir Robert Kane stated that he was induced to make this communication in pursuance of a suggestion thrown out on a former evening by Prof. Graves, to the effect, that it was a matter much to be desired that such of the members of the Academy as had it in their power to do so should bring under the attention of their fellow-members such specimens as they might possess, or be enabled to procure, suited to illustrate the condition in which the arts and manufactures existed in Ireland, at a comparatively ancient period. Some of the specimens were found upon the property of Lord Dillon, in the County Mayo, and consisted of the remains of small forges. The ore used at these forges was what was known as "bog iron ore"; was met with in an almost unlimited quantity in the same neighbourhood, and contained a large percentage of iron. The learned gentleman exhibited a portion of a bar of "pig" iron found in the same situation, and distinguishable from the "cast iron" of the present day by its highly crystalline character, and the inferiority of its finish. He next drew attention to some slags found between Killybeg and Milltown, which appeared to be so pure as to have nearly acquired the constituency of crown glass. This was probably owing to the quantity of wood ashes supplied by these ancient furnaces, which were fed with timber. Connected with the iron manufactory in this district was a bottle manufactory, in which some of this slag was made into bottles. Indeed, he had been given to understand that some of the bottles manufactured in this locality were still to be found in the possession of persons resident about the district; and he hoped to be enabled before long to procure some of these old-fashioned articles, in order that they may be added to the museum of the Academy. Having drawn attention to some specimens of the ore anciently used in Kerry in the manufacture of iron, the learned gentleman exhibited a few pieces of calcareous tufa, which were discovered in large quantities near the iron works in the County Mayo, to which he had referred, and was extensively employed as a manure for treading the land in the neighbourhood.

THE ELECTRIC TELEGRAPH IN IRELAND.—GREAT SOUTHERN AND WESTERN RAILWAY.—The electric telegraph has been recently erected upon a portion of this line, extending from the King's-bridge terminus to the extensive works of the company at Inchicore, a distance of about two miles. The telegraph adopted is the improved one, invented and patented by Messrs. Brett and Little, London. The great simplicity displayed in the construction of the instruments is not the least remarkable feature about them. At present this is the only telegraph in operation in this country. It works remarkably well, messages being transmitted and received back with the greatest rapidity. One peculiarity of this telegraph is, that the wires usually placed upon poles are in this instance buried at a considerable depth in the ground. No person travelling on the line would suppose that such a mysterious agent as the electric telegraph was at all in operation. Two great advantages are gained by the adoption of this plan—namely, security from the effects of lightning and depredations. The means employed for generating the electric fluid is somewhat novel, and consists in the use of a certain salt, known to chemists as chloride of calcium, being, in fact, the pure base of lime. This salt has the property of attracting sufficient moisture from the atmosphere for keeping up the supply necessary to work the telegraph, thereby entirely dispensing with the use of acids, found by all electricians so destructive to the metals employed.—*Dublin Mercantile Advertiser.*

CAST-IRON GIRDER.—Our attention has been directed to an exceedingly ingenious, yet simple, model of a cast-iron girder, suitable for railway bridges, of a span of 100 feet or upwards, which bids fair to surpass any other we have ever seen. The advantages which this beam possesses, is in the construction of the joint, as the joinings of the two half beams in the middle of the span, where girders of a very long stretch cannot be cast with any safety, in consequence of breaking, and damage they might sustain thereby. The beam in question is made and invented by Mr. Rutter, railway inspector, of this neighbourhood, and who has been long directing his attention as to the best means of carrying out his object; but as the invention, we believe, is not yet patented, we are, of course, unable to disclose anything further as to the principle upon which Mr. Rutter has formed his plan. But from its strength and neatness when put together, we believe that its merits cannot fail to recommend it to the notice of engineers and railway companies.—*Derby and Chesterfield Reporter.*

THAMES TUNNEL COMPANY.

The number of passengers who passed through the Tunnel in the week ending June 16 was—No. of passengers, 15,063. Amount of money, £62 15s. 3d.

ON PYROGEN. No. X.

BY JOHN JOSEPH LAKE, ROYAL LABORATORY, GOSPORT.

One of the properties of the electric fluid, which it possesses in common with other matter, is that of requiring space to move in. This is forcibly illustrated by its destructive effects upon trees, and other bodies affording insufficient accommodation for its passage—hence the necessity of providing a sufficient surface in lightning conductors. The disruptive effects of lightning upon trees is to be attributed to the pyrogen finding a better conducting medium in the sap than on the surface, and the repulsive force of the particles of the pyrogen of the charge being stronger than the cohesive force by which the substance of the tree is held together. To the action of pyrogen in this way may be attributed its heating effects, when passing along a metallic conductor affording insufficient accommodation for its passage. When a very thin wire is placed in the battery circuit, its molecular condition is disturbed by the pyrogen communicating to its particles a disposition to separate, so as to afford sufficient room for it to move. The strength of this action is in proportion to the quantity of pyrogen. When there is only a certain amount of it, the molecular change is but in an incipient state; and a certain degree of motion by expansion being given to the particles, heat is developed—an effect similar to that produced by hammering metals, especially the more ductile, as lead. With a larger quantity of pyrogen, the molecular disturbance is carried to the extent of destroying cohesion between the particles of the metal, which deflagrates, or is dispersed altogether, in some instances, when a very large quantity of pyrogen has pushed the destruction of the cohesive force to such an extent, that actual repulsion has for the instant taken its place. This view of the subject appears to be confirmed by the effects of bodies in the state of powder, or minute division—as powdered sulphur and resin, gunpowder dust, metal filings, &c. If a small quantity of any of these be lodged on the prime conductor of an electric machine, as soon as the working of the machine commences, they fly off in all directions; also, if a charge be sent through any of these substances in their powdered state, they are altogether dispersed, and no perceptible heat is produced. Owing to the operation of these laws, no sensation of heat is perceived in passing a current of pyrogen through any part of the body—a sufficient accommodation being provided for its passage; but if the fluid pass by an insufficiently or imperfectly conducting medium, heat is developed, as when water, or a too fine wire, are employed, and chemical effects requiring elevation of temperature are produced, as the inflammation of gunpowder.

The power of platinum, and some other metals and substances, to determine the combination of a mixture of oxygen and hydrogen, affords a highly interesting subject of inquiry, in connection with that of the molecular state of bodies. With platinum plates having very clean surfaces, the combination proceeds quietly, the metal becoming heated; platinum foil, very thin and clean, inserted in a mixture of those gases becomes red hot after a time, and the residue of the mixture explodes; and spongy platinum becomes immediately red hot, producing instant explosion, in a mixture of oxygen and hydrogen, or of hydrogen and air. It has been supposed that this union results from the condensation of the gases on the surface of the metals, and that oxygen and hydrogen are thus brought within the sphere of their mutual attractions by a temporary increase of density, whereupon combination ensues. But this seems to be an awkward theory. It has yet to be discovered that an increase of density is necessary to produce combination between these two gases; and, further, it is difficult to conceive how platinum particularly can produce this condensation. The existence of pyrogen admits of a much more natural and philosophical theory, and one that is supported indirectly by facts. The platinum in this case seems to perform the part of a catalytic agent, and carry out a principle which, as far as I am aware, has not yet been observed to prevail in nature—namely, that no two simple or elementary substances can combine without the assistance, by mere presence or otherwise, of a third, which when presented in a proper state, produces the union. This law also holds good with many compound substances, with some absolutely and entirely, so that the chemical action is prevented without the presence of the third substance—for example, the non-oxidation of iron in dry air at common temperatures, also by pure water free from air and carbonic acid; and, as respects others, when the action is sluggish, until the introduction of the third substance, as manganese with chlorate of potash, for procuring oxygen.

This catalytic action of platinum presents to our view a series of miniature electric batteries. When the gases in question are mixed, each atom of one gas is supposed to have an atom of the other in juxtaposition with it. When two atoms of these gases, thus circumstanced, lay in contact with the clean platinum, a current of pyrogen is set up through the metal and the two atoms of gas, which continues until the atoms combine, making way for others, which as rapidly combine, and so on, silently and gradually, until the union of the whole is brought about. Heat is naturally produced by these currents, not because of their intensity, for their weakness is proved by the trifling diets that will prevent their formation; but by their numbers, which heat is shown by the elevated temperature of the metal; and the thinner the metal the greater is the heat, for the thick metal keeps it cooler, whilst with foil the currents on each surface inclose, and there is no space of metal between them to absorb the heat: hence the red heat that soon results when foil is employed.

When the metal is more minutely divided, as in its spongy state, a still greater surface is presented to the gases, and so little heat is lost in consequence, that red heat ensues immediately on the immersion of the metal in the gases, or even in a mixture of hydrogen and air. Other substances cause these gases to unite in a similar way, as palladium, gold, and even stones and glass, but in an inferior degree, since they often require to be aided by a little heat. This latter circumstance affords a proof of the correctness of some of the principles advanced in these papers; for, by heating stones and glass, their molecular condition is so far altered, as already referred to (Paper VIII.), that they become conductors, and so capable of taking the place of the platinum in this instance. The alteration in the molecular condition of palladium and gold appears also to promote their power of facilitating these currents.

Ether and alcohol appear to be capable of developing electro-chemical properties. When dropped on platinum black, they become changed by oxidation to acetic acid, which is also the case if kept insecurely stopped from the atmosphere. The electro-chemical nature of the operation seems to be proved by the inflammation that takes place when the action of the pyrogen is sufficiently intense. Spongy iron acts in an electro-chemical manner analogous to platinum, burning spontaneously when exposed to the air, its comminuted state probably producing electric effects, similar to those of spongy platinum. These facts, thus explained, agree with the theory concerning the origin of flame in No. II. of these Papers.—(See *Mining Journal*, April 14.)

ORIGIN AND RECLAMATION OF PEAT BOG.—We have received the second volume of the *Transactions of the Institution of Civil Engineers* (Ireland), published by Mr. Weale, of Holborn, in which are several papers of considerable interest. The most important, perhaps, at present, as relates to the salvation of that country, and the employment of its population, is one from the pens of B. Mullins, Esq., the vice-president, and M. B. Mullins, on the "Origin and Reclamation of Peat Bog, with Observations on the Construction of Roads, Railways, and Canals in Bogs," from which we now give a few extracts, as being of a highly practical character, in a chemical, mechanical, and agricultural view. Among the various causes to which the growth of peat has been ascribed, is that of the destruction of forests, interrupting the drainage of a country, producing stagnant water, and the consequent growth of aquatic vegetable matter—in fact, this was long the generally-received opinion. It was shown by Dr. Anderson, of Edinburgh, that this opinion was fallacious, by proving that in many bogs no timber is to be found; and that there is a predominant and peculiar moss found in all, whether with timber or without. This peculiar aquatic vegetable, produced at a low temperature, is the *Sphagnum palustre*, or bog moss, found growing on the surface in greater or less activity, according as water is more or less abundantly supplied to its roots, which extend often to 4 or 5 feet into the pulp beneath—the pulp itself being formed by the slow decay of the preceding growth of moss, with its fibrous roots, which had served the purposes of the growing plant. The luxuriant successive growth of aquatic plants, and their rapid putrefaction in the morasses of warm climates, do not produce peat—the moss necessary being supported only at a low temperature. Such morasses give out gases destructive to animal life; while the mossy products of colder climates change in the lapse of time into a soil—on the surface of which, when only partially drained, animal life may be sustained to old age; and its antiseptic powers are so great, that not only trees, cones of the fir, rubs, and garments, but even dead bodies, have been found entire in a state of perfect preservation. Having thus shown it to be reasonable to conclude that a certain degree of cold, as well as moisture, is necessary to produce moss of the necessary description for the peat formation, and that neither timber nor the decomposition of aquatic grasses will account for its peculiar growth, the writers proceed to detail the nature of the bogs cut through for forming the Grand Canal, and the finding of oak trees of large dimensions, with their trunks broken off, and their roots fixed as they grew in the gravelly bottom, in the bog of Pullocks, in King's County; while no remains of timber were found in those of Edenderry or Ballinacree—these having doubtless been, at a remote period, the sites of deep lakes, formed by large rivers in the vicinity. Instructions are then entered into for the proper drainage of bogs, the manures to be applied, and the best succession of crops to be cultivated. The remaining portion of the paper consists of observations on the formation of roads, railways, and canals, the errors which have been made, and the means to be adopted for their successful completion, and with such economical results as shall render them industrially valuable as national works.

ON THE CUSTOM OF TIN BOUNDS.

BY EDWARD SMIRKE, ESQ.

The earliest recorded notice of any custom in Cornwall or Devon to work for tin on the land of another is to be found in the charters granted to the tinners in the reigns of John and of Edward I., by which the right is conferred, or confirmed to them; "sodere stannum in moris et feodis episcoporum, abbatum, &c., sicut solebant et consueverunt, et in terris moris et feodis nostris et aliorum quorumcumque in comitatu, et divertere aquas ad operationem eorum, &c., sicut de antiqua consuetudine consueverunt." These charters, and the principal franchises contained in them, are evidently designed for the immediate benefit of those who are there described as "operantis in stannaria," and to them only "dam operantur in eisdem." (See the charters in 4 Inst. 238, &c., and Appendix to Vice v. Thomas, pp. 8, 14.) Nor are there wanting other proofs that the interest or property in tinworks could be claimed under the custom by those only who made it available by working, and that they became vacant or were forfeited by discontinuance.

In a register of the Black Prince preserved among the public records, there is a writ, 25 Ed. III., reciting that tinners, claiming any interest in tinworks, and refusing to work or contribute to the working, forfeit their shares by the ancient usages ("solum les anciens usages"); and the proper officer of the duchy is commanded to enforce compliance with the custom by seizure of the forfeited shares. (See Vice v. Thomas, Appendix, pp. 24, 25.) In a Stannary court-roll, 4 Ric. 2, there is an entry of a plea of trespass, *vi et armis*, for breaking and entering a tinwork of the plaintiff, and ejecting him from it; to which the defendants plead "quod dictum opus stannum fuit vacans die quo supponitur, &c., et per unum quartum anni ante, et petunt inde iudicium. Et querens dicit quod non fuit vacans die, &c., et hoc." (Appendix, ibid. p. 64.) In another court roll of 21 Hen. 6 (Chagford Stannary), extant among the records of the Augmentation Office, Smith and Horn complain of a trespass by disseising them of two parts of a tinwork: the defendant pleads that at the time of disseisin the work was "opus alius," and so he entered according to the Stannary custom. Verification: Denial. Issue thereon, and award of venue. The term *alio* is well known to be applied to a neglected or deserted tinwork. (Pearce's Laws, &c., of the Stannaries, pp. 194, 201, 226, &c.)

So little did the custom contemplate the possession of tin bounds by any except working tinners, that at a Devonshire Stannary Parliament, held 10 Hen. 7, and ratified by Prince Arthur, it was provided that "no persons, neyther parsons, having possession of landes and tenements above the yorely value of 10*l*., nor none other to they use, be owners of any tinwork or parcell of any tinwork," with the exception of persons claiming by inheritance, or possessed of tinworks on their own freeholds. The original record is preserved in the treasury of the Exchequer.

As late as the end of the 16th century, the obligation of working was not forgotten in Cornwall; for Carew says: "These bounds be" (the bounder) "is bound to renew once everye yeere, as also in most places to bestow some time in working the myne, otherwise he loseth this privilege." (Survey of Cornwall, f. 13 b. ed. 1769.) These authorities, which a more extended search would doubtless multiply, seem to confirm the conjecture of the court (ante p. 86) "that the unqualified right now claimed is but an abuse of the original limits of the custom." But the custom of bounding, even with the reasonable qualification of working suggested in the above judgment, must be admitted to be open to very grave objections.

No parol or documentary evidence has ever been adduced that prescribes any limit to the area capable of being included in a pare of tin bounds. The want of some clear rule on this head strongly distinguishes the custom of bounding from any other known mining custom, English or foreign. According to the learned reporter of Rowe v. Brenton (3 Man. and Ry. 497, note a), it must be of "reasonable extent," but the test of reasonableness is not pointed out. Carew, an author of some authority on this subject, who wrote in the reign of Elizabeth, says that, when a mine is found, "the first discoverer aymeth how farre it is likely to extend, and then at the four corners of his limited proportion diggeth up three turfs," &c. (Survey f. 13 b.) If this is the mode of fixing the limit of the bounds, it is one that must be founded on mere conjecture until the mine is opened, and its direction and dip ascertained, which cannot be done until the bounds have been made good by proclamation and possession. In other words, the limits of the bounded space can only be determined by a process which supposes them to be already fixed.

Again: if a large area is included, what extent of working within it will satisfy the custom, so as to protect the bounder in his enjoyment of the whole? Will inconsiderable workings in one part secure the exclusive right to all? The question is of some practical importance; for "a pare" (or party) of working tinners will make but slow progress in bringing to grass the mineral sub-strata of a large surface; and there is nothing in the custom to show that the size of the bounds is to be proportioned to the capacity or capital of the bounder. In practice, tin bounds are said to be usually of small extent; yet one of the witnesses in the case above reported had himself assisted in cutting a pare which extended "a quarter of a mile each way," and must, therefore, have contained about 160 acres. In Devonshire, where the same custom has prevailed, the whole of Dartmoor, consisting probably of 50,000 acres at least, was, in the year 1786, included in a single pare of bounds by a person who intended by this ceremony to secure to his employer all the tin within that district.

Further, the right of the bounder is of no value without the use of running water; and this additional easement has, therefore, been constantly claimed as part of the custom. (Pearce, v. xiii, 190, &c.) It is recognised in the charters of John and Edward I., above cited (p. 41), and the roll of the Stannary Parliaments, and is often noticed in the entries of the "Opera Stannaria," or tin bounds, in the Stannary court-rolls. Yet it is evident that the enjoyment of this easement involves a claim of right both to divert streams of water flowing above the bounded district, and to discharge the water, with its acquired impurities, over all the lands below it. That such a claim is likely to experience little favour from the courts, may be conjectured from the case of Eastard v. Smith (2 Moo. and Robt. 129).

The custom asserts a right, not only to take tin, but "to search for" it. (3 Man. and Ry. 497, note a.) Whether the search is to be justified only by the successful result of it, or the claimant is to dig at will for an unlimited time over the bounded area on the mere chance of success, is a matter on which the custom and its interpreters are silent. If the larger power exists (as it is usually assumed to do), it is one which may seriously affect titles; for all Cornwall is admitted to be stannary, and all Devon is claimed to be so. (See the Minute of the Privy Council, 7 Car. 1; Appendix to Vice v. Thomas, pp. 36, 37.) The custom is indeed confined to *waistrel*; but enclosed land "that hath been anciently bounded and assured for waistrel," is included in this description (Convok. 12 C. 1, art. 3, ante p. 4, note b); and all Duchy land belonging to the seventeen assessorable manors, whether waste or enclosed, is asserted by the tinners of the Convocation, 26 G. 2, to be subject to the custom. (See art. 8, ante p. 6, note b.) Accordingly, it was stated by one of the witnesses in the present case, that the parish church and cemetery of Helston are now actually situate within tin bounds; and by another witness, that he "believed all the lands of the Duchy in Cornwall were bounded or boundable."

The custom nowhere provides for the occurrence of veins of mixed metals, but is evidently adapted only to the superficial tinworks, formerly very productive, called stream-works. Mines are now worked indiscriminately for tin, copper, and such other metals as may be, and often are, combined in the same lode. The separation of them is a process of some nicety; and one mineral is sometimes sacrificed for the sake of the other. The adventurer avoids any question, by taking a lease or license from all parties interested in the different minerals; but the bounder, who relies upon the custom alone, must either claim, under that custom, a right to deal with, and, if need be, destroy the property of another, or must work at the peril of becoming an involuntary wrongdoer, by detaching from the vein a metal which does not belong to him, and which was not the object of his search.

A still more serious difficulty will occur. There is a great extent of land in Cornwall which is, or heretofore was, of customary tenure. The tenement of Galidra, mentioned in the case now reported, belongs to this class. In such lands the mines belong to the lord of the manor, and not to the customary tenant (Rowe v. Brenton, 3 Man. and Ry. 133; S. C. 8 B. and C. 787); and the toll is paid by the bounder to the lord, and not to the owner of the surface, who alone is injured by the workings, but to whom the custom awards no share or compensation at all. Hence the consideration mainly relied upon in support of the reasonableness of the custom fails in a large class of tenements, constituting probably more than one-half the land subject to its operation. It is remarkable that in Devonshire, where the custom of tin bounding has also prevailed for some centuries, the title of the land owner, whether freeholder or customary tenant, to toll or to any other compensation whatever, has never been recognised. That the custom, as there claimed, is untenable in law, can hardly be doubted; but the small extent of tin workings in that county, and the consequent inconsiderable value of tin bounds, make the validity of the custom a question of little importance. In Cornwall the subject is one of greater interest, both to the bound-owner, whose title is shaken by the above decision, and to the landowner, whose estate, though relieved from the existing servitude of dormant bounds, can no longer be protected from the intrusion of *bona fide* adventurer by the convenient form of an annual renewal of bounds for his own use.

ACCIDENTS.

Merthyr.—John Davies, bricklayer, was killed on the 11th inst., by a carriage in one of the drifts going over him.—John Jenkins was killed in one of the Cyfarfilla levels on the 12th inst., by a fall of stone from the roof.

Newcastle.—On the 6th inst., Mr. John Godly, the overman, was passing through the workings of Little Usworth Colliery, some stones fell upon him, and killed him on the spot. He was an excellent character.—A sad accident, attended with loss of life, has occurred at Gowerth Pit. It appears that, as J. Lawson and J. Does, with four companions, were engaged in making a staple, an explosion took place, and upset the cage in which the two former were working, when they were precipitated to the bottom, a distance of 50 fathoms, and killed—the other four persons being seriously injured.

Dudley.—On Thursday week J. Owen was dreadfully injured all over his body by a fall of coal, at Messrs. Williams's Wednesbury Oak Colliery; several ribs and his right collar bone were fractured, but he is progressing favourably.

Mining Correspondence.

[The Commissioners of Inland Revenue having notified to us their resolve to charge with advertisement daily all reports having the agents' names affixed, we appealed to them in a memorial, setting forth that we, or the respective companies, derived no advantage therefrom—the only object sought, or obtained, being that of affording to the mine adventurer and public the greatest guarantee we could for the truthfulness and *bona fide* nature of the statements periodically set forth, by authenticating them, and thus fixing a responsibility on the writer. The Commissioners have replied, that "the reports, with names attached, are advertisements, and that duty will be charged thereon." We have no alternative but submitting to their dictum. How far the Commissioners are correct in the view they take, our readers can judge as well as ourselves;—we can but hope that, on reflection, they will see the error into which they have fallen, and rescind the orders they have issued. All reports inserted under this head, however, may, as heretofore, be considered as furnished by the regular agents of the company; and we shall carefully guard against the publication of statements which cannot be relied on as correct.]

BRITISH MINES.

BARRISTOWN.—The lode in the end driving south, on the junction, is 2 ft. wide, with a good mixture of ore through it, producing about 5 cwt. of lead per fm.; the adit end east is still without a lode; the stopes in the bottom of the adit level are producing about 7 cwt. of lead per fm. The back and bottom of the 16 fm. level are poor; also the winze sinking in the bottom of the 16 fm. level. The back of the adit level is producing about 10 cwt. of lead per fm. west of adit.

BEDFORD UNITED.—At Wheal Marquis we are driving by the side of the lode in the 90 fm. level east. The lode in Bayley's winze remains without alteration; it is 2 ft. wide, and worth 4 tons of good ore per fm. In Crow's winze, in this level, the lode is 18 in. wide, and worth about 2 tons of ore per fm. There has been no lode taken down in 70 fm. level east. The pitches continue to yield good returns.

BRYN-AR-IAN.—The engine-shaft is down 10 fms. below the deep adit level; the lode in it is 7 ft. wide, with several small branches of ore, yielding 10 cwt. of ore per fm.; the stope in the back of this level, east from the shaft, is not quite so good as last reported—now producing a ton of ore per fm.; the stope in the back of this level, east from the winze, is producing 15 cwt. of ore per fm.; the stope in the bottom of the old men's workings, in the shallow adit level, is producing from 8 to 10 cwt. per fm.; the stope in the back of the deep adit, 17 fms. west from the shaft, is producing 3 tons of ore per fm. Our water-wheel and crusher are now in course of working; but at present we are rather short of surface water, therefore we cannot get on with our dressing as fast as we wish.

CALLINGTON.—Kelly Bray engine-shaft is now down 9 ft. below the 32 fm. level; the lode presents itself in two branches, with occasional streaks of ore. In the 50 fm. level east, on Kelly Bray lode, the lode is 2 ft. wide, producing copper ore. In the 70 fm. level east we are carrying about 2 ft. of the lode against the north wall—in this level we are in daily expectation of good ore ground. The 90 fm. level east is at present poor; in the 90 fm. level, west of the lead lode, the lode is 14 ft. wide, producing good stones of copper ore. In the 100 fm. level, west of ditto, the lode is at present poor. The north engine-shaft is now being sunk 10 fms. 3 ft. below the 112 fm. level, ground rather harder than usual for sinking. In the 112 fm. level north we are opening moderate tribute ground; in the 112 fm. level south we are laying open good tribute ground at a low tribute. In the 100 fm. level north the lode is producing silver-lead ore; in the 100 level south the lode is 1 ft. wide, yielding about 5 cwt. of lead per fm. In the 90 fm. level south we are laying open ground that will work at a high tribute. At the south mine, in the 125 fm. level, the lode is 1 ft. wide, producing 4 cwt. of silver-lead ore per fm.; in the 125 fm. level south we are opening tribute ground. In the 112 fm. level north the lode is at present disordered by a small slide; in the 112 fm. level south we are opening tribute ground; in the 100 fm. level north we are laying open good tribute ground, but cannot work the back of this level before a communication takes place with the north mine, which will occupy, say about two months from this time. In the 90 fm. level south the lode has a very promising appearance for silver-lead ores. The 70 and 40 fm. levels are in ground congenial for silver-lead ores. We sampled on Saturday last 41 tons 6 cwt. of copper ore; also, this day, computed 36 tons of rich silver-lead ores. Samples of the same are forwarded to the different smelters.

CWM ERFIN.—The 20 fm. level, east of the engine-shaft, is worth 8*l*. per fm. The stope behind this end is suspended at present, in consequence of a bad supply of air; the stope east of the engine-shaft is worth 10*l*. per fm.; the sink under the 10 fm. level is worth 15*l*. per fm. for the length carried (14 ft.). The 30 fm. level, west of the winze-shaft, is worth 2*l*. to 3*l*. per fm.; the end east is poor; our bargains in the 20 fm. level will be stopped on Monday, unless we get a change of weather; our surface water is not sufficient to keep our water in fork. We are doing our best in dressing our lead and copper.

DEVON AND COURTENAY.—The lode in the end driving west, in the 40 fm. level, is 4 ft. wide, composed principally of white iron and prisms, interspersed with bronzes and stones of beautiful yellow and coated ore, especially on the north part of the lode. In the end driving east, in the 50 fm. level, on the south lode, we have intersected a small cross-course, beyond which the lode has not been taken down; the lode in the stopes, in the back of the same level, continues without any alteration since my last report, producing about 1 ton per fm.

EAST CROWDALE.—In the 28 fathom level, we have cut through several branches, which contain tin of a good quality; this has induced me to extend west on their course, and I find that in a few fathoms they will unite, when we may expect a course of tin. Two of the men lately engaged in the adit level are now employed stopping off a piece of lode in the bottom of the level, and are breaking some good tin stuff; the remaining ten men are employed sinking a winze below the adit level; and I am proud to inform you, that the appearances are such as come up to my most sanguine expectations; it, at least, produces 40*l*. worth of tin per fathom, and clearly demonstrates that the 28 fm. level is about to show us something very good and very profitable. Tippett's stope, in the back, is just the same as when last reported upon, the men in the past week having been engaged putting in stuff. Paul's stope is not so good; the lode produces more magnetic and killas, but I hope it will soon resume its usual good and kindly appearance.

ESGAIR LLI.—The south lode, in the stopes in the bottom of the deep adit, east of the engine-shaft, is about the same as last reported, which will yield, on an average, 10 cwt. of ore per fm.; the north lode in the deep adit east is now yielding a very large quantity of water, and is beginning to produce a little lead, but not sufficient to put a value on; but, from its present appearance, I think it is very likely to improve; the lode in the winze, in the bottom of the shallow adit, is much the same as last reported, and will yield, on an average, one ton per fm. The party who took the lode to sink at our last survey day, at 7*l*. 10*s*. per fm., declined to work it, in consequence of there being so much water in it—in fact, they had 150 barrels of water every 24 hours to draw; and I think it is very probable that they could not get the winze down to the level (2 fms.) on and on Thursday, in the 14 ft. in order to explore this important place, I took from the stopes on the south lode, in the bottom of the deep adit, east of the engine-shaft, the best party of men by far we have in the mine, and put them to sink the winze at the same price as was refused by every other party; and on Friday, the very next day, we cut such a powerful stream of water on the north lode, in the deep adit east, as to draw the lode in the winze comparatively dry—an indication in itself, in my opinion, which speaks volumes in favour of the piece of ground between the deep adit and the shallow one; and I think my next report is very likely to bring you some better news from the north lode in the deep adit east.

HAWKMOOR.—Both the ends of the 10 fm. level are still productive of fine yellow ore, with spar, &c. The south end is now reported, which will yield, on an average, 10 cwt. of ore per fm.; the better course of ore than has yet been seen is any other part of the lode, highly promising to make a good and lasting mine.

HEIGNSTON DOWN CONSOLS.—The sinking of Bayley's engine-shaft, as also the indications for minerals, is much as last reported. In the 35 fm. level, east of Bayley's shaft, a cross-cut north has been driven 6 ft., to ascertain the size of the lode, but has not reached the north wall. The lode in Hitchin's shaft is improved during the present week, and producing some good saving work.

HOLMBUSH.—The lode in the 132 fm. level, west of the diagonal shaft, is 1 ft. wide, composed of spar, mounds, and stones of copper ore. The ground in the 120 fm. level, south-east of Hitchin's shaft, is favourable; the lode in the 120 fm. level south is 4*l*. ft. wide, producing 3 cwt. of lead per fm.; the ground in the 120 cross-cut south (by the great cross-course) is still favourable, and we hope the men will accomplish 7 fms. this month. The lode in the 110 fm. level south is 3*l*. ft. wide, composed of quartz and lead, producing 5 cwt. of the latter per fm.; the lode in the back of the level will produce about 3 cwt. of lead per fm. We have taken down about 6 ft. of the dip-jack lode since last reported on, and it still retains its size, and will produce from 3 to 4 tons of copper ore per fm., making two well-defined walls, and in the midst of a beautiful clay-slate stratum.

KIRKCUDBRIGHTSHIRE.—The lode in the 50 end east is 3 ft. wide, with a small branch of lead ore on the south wall, and yielding 4 cwt. to the fm.; the lode in the 50 end west is 4 ft. wide, and yielding 8 cwt. of lead per fm. The lode in the 40 end west is 2 ft. wide, and has stones of ore through it; the lode in the winze, in the bottom of the 40 east, is 3 ft. wide, and rather poor. The shaftmen have been altering the pit-work this week, and have consequently done nothing in the bottom ends.

LAMHEROEE WHEAL MARIA.—Davey's shaft is now sunk to 46 fms., and in the engine-shaft the F lode was cut out on the 1st May, about 53 fms. deep, which is described by the agent as a strong and promising lode, and composed of capel, quartz, mounds, and copper throughout. The lode gives out a large quantity of water (proving it to be of large size), but by which the work of sinking has been in some measure impeded, whilst from its position in the shaft it will require 3 or 4 fms. of sinking to cut through it. Altogether, the committee consider the prospects of the undertaking quite satisfactory.

LOSTWITHIEL CONSOLS.—I have set the men to drive on the lode till the end of the month, at 4*l*. per fm.; the ground is a trifle harder, but the lode holds its size, or is rather a little larger than when we first cut it; it is, besides the capels, nearly 3 ft. wide, and a most promising lode. We ought to make all speed to get under the adit, beneath the rich argilliferous gossan. The lode is a general favourite with the miners around, and I cannot but hope, that as we drive across the bottom, towards the adit mouth, and along under the adit, we may gradually come into a course of ore, as the ground was far easier in the south hill than in the north.

MENDIP HILLS.—No alteration whatever has taken place in the appearance of the slag-stuff in Charterhouse Valley since my last report, the beds of slag which we are now opening through being from 15 to 17 feet thick, producing good slags. In Ubley and Blackmoor we are progressing satisfactorily with our different operations; we have the whole of the washing strakes and slime-boxes fixed in both the dressing-floors, and the carpenters are busily engaged making and fixing the necessary machines for cleaning the slags and slimes; the boiler was brought home on Saturday morning last; the engine will be forwarded in the course of a few days.

SOUTH WHEAL JOSIAH.—We have driven in the adit end, on Jack Thomas's lode, about 4 fms.; the lode is not so large, but is still of a promising nature, with spots of ore through it, with a flock on the south wall. On Monday last, we cut a rich tin ore about 24 feet wide, in a shale pit. I was induced to search for this lode, from the quantity of rich shale stones found lying on the surface near this spot; and, from samples which I have had assayed, and the lode producing tin of the very best quality, and having a stream of water on the mine, we shall put up a stamp, and commence stamping as soon as possible; the discovery being at the surface, and the lode easy to break, a large quantity of good work will soon be in order for the stamps. We have also cut two other tin lodes, that will produce a little tin, but are not rich.

SOUTH WHEAL TRELAUNY.—The engine-shaft is in course of sinking with nine men—ground still favourable. I sunk below the 30 fm. level about 5 fms.; the side we have cut in the shaft is better as we go down; the water from the 30 cross-cut and spary branch has increased during the past week.

TAMAR SILVER-LEAD.—The engine-shaft is sunk 3 fms. 9 ft. below the 190 fm. level, the lode in which is small and poor. In the 190 end the lode is 18 in. wide, work of a coarse quality. In the 175 end the lode is 1 ft. wide, 6 in. of which is good work. In the 160 end the lode is 3 ft. wide, and opening profitable ground. In the 145 end there has been no lode taken down since last reported on, but the disordered wall is presenting a favourable appearance. In the 135 end the lode is disordered by a slide, coarse and unproductive. At North Tamar, in driving north in the 80 fm. level the lode is 6 in wide, good stamps work. In the 70 end, driving north, the lode is 3 ft. wide, producing a small quantity of ore; in the end driving south, in this level, the lode is 18 in. wide, yielding work of a promising nature. Our last parcel of May ores, weighing 91 tons 12 cwt., was sold to the Tamar Smelting Company, at 20*s*. 6*d*. per ton.

TINCROFT.—At East Pool lode, in Palmer's shaft, sinking below the 90 fm. level, the lode is 2 feet wide, ore, but not to value. The lode in the 80 fm. level west is worth 8*l*. per fm. for copper. We have commenced driving a cross-cut under Stalsby's shaft in the 54 fm. level, and anticipate commencing in the course of a fortnight. We are now driving the 35 fm. level from East Wheel Croft; the lode is 14 ft. wide, with stones of copper ore; by driving this level about 3 fms., we expect to meet with the run of ore gone down in the bottom of the 24 fm. level. At North Tincroft lode, we are sinking below the 400 fm. level; the lode is 3 feet wide, with stones of copper ore. In the 100 fm. level east the lode is 5 ft. wide, worth 12*l*. per fm. for copper; in the 100 fathom level west the lode is worth 12*l*. per fm. for copper. The lode in the 90 fm. level, east of Willoughby's shaft, is worth 8*l*. per fm. for copper; in the same level west the lode is worth 12*l*. per fm. In the 120 fm. level, west of engine-shaft, the lode is worth 12*l*. per fm. In the 80 fm. level, east of Willoughby's shaft, the lode is worth 8*l*. per fathom for tin. At Highbury tin lode, the lode in the 152 fm. level, east of engine-shaft, is worth 9*l*. per fm. The 142 fm. level, east of Martin's east shaft, has not been driven since last reported; the stopes in the back of this level, east and west of the shaft, are worth 14*l*. per fm. In the 132 fm. level, east of Martin's east shaft, the lode is 4 ft. wide, and worth 16*l*. per fathom; the west end, same level, is worth 13*l*. per fm.; the stopes in the back of this level, east and west of the shaft, are worth 12*l*. per fm. In the 120 fm. level, west of engine-shaft, the lode is worth 12*l*. per fm. At Chapple's lode, in the 100 fm. level, west of downward shaft, the lode is 5 feet wide, and worth 10*l*. per fm. for copper. The 90 fm. level west is worth 17*l*. per fm. for tin and copper; in the winze, sinking below this level, the lode is worth 16*l*. per fm. for copper. In the 80 fm. level west the lode is worth 10*l*. per fm. for copper. At Wheal Druid lode, we have begun to cut plat, &c., in the 33 fm. level, and in about two weeks anticipate sinking the shaft below that level. On Wednesday next we shall sample about 400 tons of copper ores.

TRELEIGH CONSOLS.—Garden's shaft, below the 113 fm. level, sinking in the country, is nearly 7 fathoms below the 113. In the 90, west of ditto, the lode is 2 ft. wide, and worth 5*l*. per fm. In the rise above the 80, the lode is 24 ft. wide, with good stones of ore, and is looking promising. In the winze below the 70, the men have completed the ground, and are put to cross-cut in the 90 fm. level, to intersect the north part of the lode. At Parent engine-shaft, below the 113, the shaft is down to the 30 fm. level, and the men will now drive to see the lode. In the 20, west of ditto, the lode is 18 in. wide, with stones of ore; in the 20 cross-cut driving south, towards the middle lode, the ground is hard. At Parent winze-shaft, below the adit, the lode is 24 ft. wide, with stones of ore. In the winze below the adit, on the middle lode, the lode is 1 ft. wide, with stones of ore, and is looking kindly; in the rise above ditto, the lode is 20 inches wide, and worth 4*l*. per fathom.

WEST WHEAL JEWEL.—The rise in the back of the 70 fm. level, west of Williams's cross-course, on Wheal Jewel lode, is worth 3*l*. per fm.; in the winze sinking in the bottom of the 57 fm. level, west of Williams's cross-course, on the same lode, the lode is worth 8*l*. per fm. The 47 fm. level, west of Williams's cross-course, on the same lode, the lode not taken down in the past week; in the deep adit west, on the same lode, the lode is producing good stones of ore. In the stopes west of Pryor's winze, in the back of the 12 fm. level, on Tolcarne tin lode, the lode is worth 12*l*. per fm.; in the stopes east of this winze, on the same lode, the lode is worth 10*l*.; in the stopes in the bottom of this level, west of Tregoning's shaft, the lode is worth 11*l*. per fm.; in the stopes in the bottom of this level, east of Tregoning's winze, the lode is worth 14*l*. per fm.

WHEAL MARY ANN.—Since my last report we have cut the lode at the 50 fm. level, Pollard's shaft, and have driven on it 3 fms., and find it to be an exceedingly promising lode, 2 ft. wide, composed of can and lead, and will produce 3 tons of lead per fathom. The lode in the 40, north of the shaft, is 14 ft. wide, and will produce 5 cwt. of lead per fathom; the stopes in the back of this level are looking very well, producing 3 tons of lead per fathom. The lode in the 40, south of the shaft, is 1 ft. wide, and will produce 5 cwt. of lead per fathom; the lode in the rise in the back of this level is small, and at present unproductive. The lode in the 30 fm. level, south of the shaft, is still split in branches, spotted with lead; the stopes in the back of this level are producing 5 cwt. of lead per fathom. The lode in the winze sinking under the 50 fm. level, north of Barratt's shaft, is 4 ft. wide, and will produce 12 cwt. of lead per fm. The lode in the 50 fathom level, south of this shaft, is 4 ft. wide, producing 3 tons of lead per fm.; the stopes in the back of this level are looking very well, producing 12 cwt. of lead per fm. The lode in the 40, south of the shaft, is 24 ft. wide, and will produce 15 cwt. of lead per fm.; the stopes in the back of this level are looking well, producing 5 cwt. of lead per fathom. We sampled, on Saturday last, two parcels of lead ore; the best computed 60 tons, and the inferior 34 tons, for sale on the 26th inst.

WHEAL TRELAUNY.—In the 82 fm. level, at Phillips's shaft, the cross-cut is extended 4 fms. east, where the ground continues favourable for driving. The lode in the 72, north of this shaft, is 3 ft. wide, and worth 9*l*. per fm.; in the same level south the lode is 2 ft. wide, and worth 17*l*. per fm.; the stopes in the back of this level are yielding a fair quantity of ore. The lode in the 62 north is 4 ft. wide, and worth 18*l*. per fm.; all the stopes in the back of this level are yielding a fair quantity of ore; the lode in the winze sinking under this level south is 14 ft. wide, and worth 9*l*. per fm.; the lode in the 52, north of this shaft, is 3 ft. wide, and worth 9*l*. per fm.; all the stopes in the back of this level are producing a fair quantity of ore. The stopes in the back of the 42 north continue to produce a fair quantity of ore; the lode in the winze sinking under the 42, north of Trelawny's shaft, is 3 ft. wide, and worth 10*l*. per fm. At the north mine, the lode in the 55, north of Wheal Trelawny boundary, is small, from the intersection of a slide, but we expect an improvement hence our having Trelawny's shaft is completed, the lode is 14 ft. wide, and worth 4*l*. per fm. The lode in the 40, south of Smith's shaft, is 24 ft. wide, and worth 7*l*. per fm.; this level north is suspended for the present, for fear of letting down the water. The lode in the 30 fm. level north is improved, producing some good spots of lead, and from the character of which, we expect a greater improvement shortly. We sampled, on Tuesday last, a parcel of lead ore, computed 106 tons, which will be sold on Thursday, the 21st inst.

WHEAL VINCENT.—We have this morning taken down the lode in the south shaft, and find it much richer for tin than any we have yet seen since we commenced sinking. I have set 2 fms. more to sink; the ground still continues favourable. In sinking the last 6 feet we have met with several large stones of solid wolfram between the floors, or layers of the lode; this, in every locality, is considered a good indication for tin. The tributaries are getting on well, they will commence stamping in a day or two. In sinking on the north lode, in the bottom of the shallow adit, we are still breaking good stamps work. I have broken this morning some of the same kind of tin that the gentleman took with him to Essex last week. Our engine-shaft is now down nearly 10 fms., the ground is somewhat of a close nature. We shall commence in a day or two to case and divide down the shaft, so as to cross-cut the lode. The stamps we purchased we shall lose no time in erecting.

FOREIGN MINES.

BOLANOS MINES.—[Received June 22.]

EL BOTE MINE, May 2.—At San Genaro shaft, the pitwork has been completed to the depth of Victoria cross-cut in two plunger lifts of 13 inches. The engine was set to work on the 29th April, and, after working for about four hours, it was stopped until yesterday afternoon at two o'clock, when it was again set to work; and I am pleased to say both the engine and pitwork admirably well. In consequence of our men having sufficient pitwork to complete the third lift, and being anxious to go to work, I proposed drawing the water by the two malacates to the Victoria plat, and pumping it from there by the engine; although at first we had some little difficulty in stopping the malacates at the proper moment, I am happy to say I have made such arrangements that the engine now works very well, making about five strokes a minute; and I am persuaded that the additional power we have thus gained will enable us, in the course of a few days, to drain the water in Taylor's cross-cut. Before resuming the driving, however, of this important work, I intend to fix the next plunger-lift, the pumps for raising the water have just arrived from Tresillo. In the Compania level east 84 fms have been driven during the month; but the vein, I am sorry to say, has not at all improved, still continuing in the same quarter, and is much disordered and poor; nor do I expect any very material change in this level until it is communicated with plan No. 3 east, in which the vein is about 34 fms. wide, in azogones of low ley. There remained at the close of the month about 34 fms. to be driven to make the communication, and which I hope to be able to complete by the middle of the ensuing week; and, from the appearance of the vein in No. 2, I think there is a probability of the level continuing in ore ground from this point to No. 3. In Plan No. 3 the vein is about 4 fms. wide, and has given us a good deal of cargo since last reporting the month, but as the plan is now nearly on a level with the bottom of Compania level, the water has considerably increased, and I have found it necessary to fix a hand-pump, to free the plan of the water; but this I hope will be only for a few days, as I am inclined to believe that the water from this point will fall towards San Genaro as soon as we can drain Taylor's cross-cut. In Plan No. 4 the vein, although it is not more than about 14 fms. wide, has given some ore of improved quality. In No. 5 the vein is small and poor. In the rise, both of Guadalupe east and San Antonio west, the vein is much disordered, and these points at present give but very little cargo. In the level east of Plan No. 2 west, 5 fms. have been driven on the vein in borra, and in Compania level west 84 fms have been driven during the month; but the vein also in this level is very much disordered and poor. Should the water in the planes be affected as I expect by the drainage at San Genaro, I may be able to commence opening ground below the Compania level, and hope to be able to report very shortly some improvement of the vein in depth. The four malacates are still kept going at San Fernando at the drainage and mantle, but, of course, as soon as we find the water lessen, they will be reduced in number.

Extracted from a letter from Mr. Birbeck, dated May 4.

I have been much disappointed in not receiving any of your favours by last packet. **CELESTINA.**—There has been again considerable improvement in one of the cieles of Providencia, which has yielded a good deal of cargo since the middle of the month, which has induced me to postpone the abandonment of the mine. I do not expect that this will be of much duration; and as soon as it finishes, I shall probably return the mine to its owners.

EL BOTE MINE.—The extraction of the month has been somewhat larger than I anticipated, owing to a reserve which had been left to the west, in the bottom of Guadalupe. This, however, has now failed us, and we have nothing to fall back upon, as all the rises have nearly given out, and the planes are poor. We are, therefore, waiting with anxiety to see the

disposal of their property; the more so, as I feel fully persuaded that their long and exemplary perseverance would have reaped its due reward, with one more effort. The day is, however, now past, and it only remains for me to pass over the conduct of the new parties, which I shall do as soon as possible, and hope to encounter no difficulty in carrying out all the arrangements."

UNITED MEXICAN MINES.—Guanajuato, May 7.

Mine of Rayas.—With immaterial exceptions, the improved condition of this mine detailed in my last letter to the court, has continued since then, and is confirmed by the realized returns of the past month having exceeded the expenditure by \$2919, and covering the deficit of \$1792 of the preceding month. The ends of Jesus and Paraisma have shown deterioration in the present week; while, on the other hand, the more important pit of Santo Toribio has developed higher and yet more promising produce, which is a very essential feature, considering the more advanced position of this point to the virgin ground in the south-east. The other various points of produce do not present anything worthy of notice here. The sales on joint account with bucanes having again slightly fallen off, I am preparing for their early reception some workings in San Cayetano thus far unexplored by them, which I believe will have the effect of increasing the sales to our mutual benefit. The comparative report of operations in the last two months respectively is shown by the following statement:—

Four weeks ending—	Picked Ores.	Half Sales.	Outlay.
March 31	Cgs. 2588	\$4447 6 0	\$22,316 7
April 30	2720	4225 3 0	20,031 7 1
Cargas	132	\$222 3 0	\$2284 7 6
	Increase.	Decrease.	Decrease.

Mine of Aldana.—The sinking of the shaft has been somewhat retarded by increased hardness of the ground, and the presence of water. A cross-cut from the old workings has been commenced to get out of them, and by means of a pit commenced the work on the more favourable ground than the former. It is intended to communicate with the shaft, to assist ventilation in the one and the other. The surface works, offices, &c., are nearly completed, and will shortly relieve present expenses.

Mine of Promontorio.—Having taken possession of this mine on the 9th ult., as anticipated to the court by my letter of the same day, I had occasion to commence operations therein at once, by placing workmen on the removal and extraction of accumulated rubbish, with the view to gain access to various points of the vein known to be in fair ore. This object having been recently attained, a cross-cut has been commenced to the south-east ground, so promising in Rayas, from the lowest depth, in order to explore the vein in that direction, entirely neglected by our predecessors, and which is already in ore of 10 marcas. Five other points, in similar ore, but higher up than the cross-cut, are now being worked by bucanes, and I hope to accomplish the sale this week of their produce. I propose to continue this reduced scale of inexpensive operations until the development therein of further resources from the mine itself, or the suggestions indicated by our speculative researches in Rayas, which will suffice for every purpose in Promontorio, and illustrates the advantage of our holding both mines simultaneously.

Quicksilver.—The invoice of 200 flasks, shipped at Liverpool, per *Josephine*, to Tampico, is to hand, and it is observed that a similar quantity of this article would be shipped, per *Speculator*, from, and to the same ports, leaving 100 for a subsequent shipment.

Remittances.—The departure from hence of the Tampico conducta is named for the 15th inst., but I regret that the extent of the present scale of mining and hacienda operations, as also anticipatory disbursements for the seasonal stocking of both branches, are the usual rainy period shall set in, will not enable me to avail of that occasion, to make the usual remittance to the directors. —J. N. SHOULBRED.

Report on the State of the Workings in the Mines of Rayas, Aldana, and Promontorio.

Mine of Rayas.—Bucanes.—During the past month, the work in which bucanes are employed have continued poor, and the sales have been, consequently, low. Menus are being taken which will, probably, increase their operations and improve the sales.

Frete de Santo Toribio.—The ore which was mentioned as having appeared last month has continued, but not improved; the rock is hard, and but 3-45 varas have been driven. The cross-cut of Santo Toribio has been driven 6-57 varas, and has not yet the vein sought.

Santo Toribio Workings.—The fronts of "Jesus" and "La Paraisma" continue in good ore, ramified in narrow threads, and, therefore, not abundant. In "La Paraisma" the ore has lately declined in the south-east extremity, but it is to be hoped that it may again improve, as "Jesus," which is more advanced in that direction, continues in good ore. The Pozo de Santo Toribio has continued gradually improving in the quantity of ore, which is now making to the north-west, under the working of San Vicente. This last-named continues in ore, but has not improved.

As the remaining works are not of speculative interest, I will merely remark, that there has been in them no change worthy of notice. The number of barren employed has been 54, with some deficiencies in the night workmen, and the amount of ore remitted in four weeks is 2,720 cargas.

Mine of Aldana.—The shaft has been sunk in the past month 14-79 varas, making the total depth up to date of 54-57 varas. That less progress has been made in the sinking is ascribable to the increased hardness of the rock, and to the appearance of a small quantity of water. One of the small veins mentioned in last report has given occasional stones of better ore than those heretofore met with. Within the mine we have commenced sinking a work towards the point where the shaft is to cut the vein; it is being driven in the same wall, in order to take advantage of a more favourable rock. This work is called Santo Toribio, and has advanced 7-34 varas.

Mine of Promontorio.—The working of this mine has been commenced on a small scale; a few bucanes are at work, and a destajo was constructed a week since for driving on it to the south-east from the deepest point in the mine. This work has advanced 1-70 varas, having at present a little fair ore in the end, and ground a-head which is believed to be entirely unexplored. —S. P. PARKMAN.

BOLANOS MINING COMPANY.

The following is the annual report of the directors, to be read at the forthcoming meeting of proprietors:—

The period of the year has now arrived when it becomes the duty of the directors to report to the proprietors on the transactions of the company since the last annual meeting, and on the present state and prospects of their affairs in Mexico. A reference to the last year's report will show that at that date the company still held possession of the mines of Loreto, Celestina, El El Estero, and the first named, Loreto, the exploratory works then in progress led to no satisfactory results, and, in consequence, the mine was finally delivered to the owners in October last.

CELESTINA.—At the date of the last report this mine was considered to offer but little encouragement for pursuing further trials; subsequently, however, some discoveries were made of ore of good quality, though in no great abundance; but as these points have again declined, it is probable that its abandonment will be immediately carried into effect. The operations of the company will in that case be restricted to the one negotiation of

EL ESTERO.—In this mine the works have been carried on throughout the year with a degree of energy which, considering the very serious obstacles that have been encountered, reflects the highest credit on the directive department. A rainy season of unexampled severity and duration has in a variety of ways impeded the numerous surface works, and, in consequence, greatly enhanced their cost; the same cause has also considerably augmented the difficulties and the costs of drainage. For a long period also the mine suffered greatly from a scarcity of workmen, but this evil has ceased to exist, and there appears to be no reason to expect a recurrence of it. Notwithstanding these drawbacks, works of no trifling magnitude have been effected; all the more important and costly surface erections at San Genaro shaft, such as the engine and boiler houses, and stacks, are completed, together with other requisite buildings; some of minor consequence have, however, yet to be finished. Underground, the works have not been on so extensive a scale as could be desired, owing chiefly to the scarcity of funds; those of most pressing importance have, however, been persevered with, and great progress has been made. San Genaro shaft has been sunk to a depth of 244 varas; and, at 230, a cross-cut (called Taylor's cross-cut) has been driven 62 varas, and wants only from 15 to 20 varas to reach the lode. Having recently cut a considerable stream of water here, this cross-cut is necessarily suspended until the steam-engine can be made available. At the date of the last letters (6th April), it was considered that by about the end of that month the engine would be ready to work, and it is further stated that in about two months more the lode may be expected to be reached, the effect of which, it is confidently said, will be to unwater all the western ground in the neighbourhood of San Fernando, hitherto the drainage shaft. The weight of water here has been so great, especially during the long rainy season, that until the end of October it was impossible to make any progress in the cross-cut of Compañia; the deepest part of this shaft; since then, however, it has been continued, and has passed entirely through the vein, on which levels east and west have been driven (16 varas east and 11 varas west), but hitherto without any discovery of importance. During the past year, and up to December, the workings on ore have fluctuated continually, both in quality and quantity, which is usually the case at such a depth, on lodes of like character. In that month, however, a great change took place in the nature of the lode in most of the deepest workings, becoming in parts quite decomposed and without metal, and in others giving specimens of beautiful ore rich in native silver. By some of the most experienced miners of the district this change is considered, as an indication, as likely to lead to increased richness in depth, in corroboration of which is cited the case of the celebrated mine of Quebradilla (situated a short distance to the east of El Bote, and on the same lode), in which strata of similarly disordered and decomposed ground occurred; but not deterred by this circumstance, the adventurers continued their trials to a greater depth, and were rewarded by a bonanza which lasted several years, during which period the produce amounted to from 6000 to 7000 cargas per week, of a value of not less than \$50,000. The immense effect, however, of this alteration in the character of the lode has been materially to lessen the returns, and although, as soon as the engine is fairly at work, some relief will be felt in the expense of drainage, other charges must then of necessity increase, for until works of trial be undertaken, and new ground laid open, it would be unreasonable to look for any material augmentation of produce. On this subject, Mr. Birkbeck, in his last letter to the court, remarks:—

"There is no prospect of improvement until the mine be drained through Taylor's cross-cut, and then, if the necessary works be not immediately undertaken for opening new ground, but little advantage is to be expected, and with my present means, I am doubtful of being able to undertake them on such a scale as is required to put the mine at once into working condition, and to ensure good results. If it be considered that the very costly erections on the surface, and the expensive deep works underground, have been borne and paid by a small portion (about 150 varas) of only one of the numerous veins which traverse the company's rights, a very favourable opinion must be formed of the general character of the lodes, and of the prospects of the enterprise."

To sink upon and prove the ore at greater depth, and to resume and extend the cross-cut towards the other lodes which are not far distant, are works, therefore, which it is essential immediately to undertake, and there appears ample warranty for the conclusion arrived at by all parties who have given consideration to the subject, that well-directed trials, with these objects, can hardly fail to result in success; and as, by means of the steam-engine, full command of the water will doubtless be obtained, the obstacle which has hitherto prevented the prosecution of these important works may now be considered removed. In considering the financial position of the negotiation, it may be well, in the first place, to give an abstract of the receipts and disbursements since the company took possession in August, 1846.

Amount of funds supplied by the Bolanos Company	\$ 43,132 1
Less \$9000, paid in London on execution of contract, and included in the above amount, and which, although a debt against the mine, forms no part of the supplies to the mine	16,744 14
Profit for 32 months, from August, 1846, to the end of March, 1849	15,494 7 1
Total	\$ 41,882 6 1
DISBURSEMENTS.	
Purchase-money of haciendas, repairs, &c.	\$ 37,210 3 1
Stores purchased	62,973 0 4
Cattle	16,201 12
Total	\$ 116,384 3 1

Brought forward	\$ 116,384 3 1
Deduct outstanding for stores purchased, cash borrowed, &c.	75,264 3 4
Balance of cash	38,190 2 1
Sundries	1,012 3 4
Sundries	2,780 0 6
Total	\$ 41,882 6 1

A similar statement in the report of last year showed the working capital then to be \$126,519 41r., which has, therefore, been reduced during the present year, to the extent of \$84,636 54r., as follows:—

Balance of expenditure for the 12 months	\$ 76,278 11
Diminution in amount of company's supplies	8,338 4 1
	\$ 84,616 5 1

From the above statement, it will be evident that to proceed with the undertaking, funds are required to provide the necessary stores, and to make the trials which are indispensable to bring the mine into an effective working condition. That this should have been done when the negotiation was first contracted, cannot be questioned; but the directors in their last year's report explained that, owing to the peculiar circumstances of the time (this mine having been taken during the late monetary crisis), it was deemed useless to make the attempt then, and the mine, up to June in last year, having made good profits, and thus itself supplied the capital, there seemed good reason to hope that there would be no necessity for calling upon the shareholders. It has already been explained how these expectations have failed of realization, and the directors see no reason whatever to feel disgraced by the circumstance of the recent falling off in the produce, which they took upon as but one of those temporary fluctuations which are continually occurring in such enterprises; on the contrary, they still entertain a confident opinion that the company has, in El Bote, one of the most valuable mining properties in Mexico, and they cannot believe that the shareholders, from apathy or any other feeling, will allow such a property to pass from their hands, which must inevitably be the result if additional capital be not provided. The nature and general character of the district have been explained in the reports of 1847 and 1848, and, nevertheless, the directors would consider themselves remiss if they failed on the present occasion again to press on the consideration of the proprietary a few of the leading circumstances connected with it. The grants are very extensive, comprising no less than twelve pertenencias, in three sets, containing numerous lodes of high character; the workings hitherto have been confined to one set only (San Eligio), and to one lode therein, but parallel to this, and at but a short distance, are four others, which may be advantageously explored by cross-cuts. From this one lode of San Eligio, and from the level only, and within a space they about cover the course of the lode, and of about 30 varas in depth, ores have been extracted, during the 32 months that the company has had possession, of the gross value of \$1,460,000. It is true that the net profit has been but small, about \$31,000 (including the value of the ores not reduced); but it must be borne in mind that, owing to the difficulties with the water, and to the circumstance of having but one shaft, the ores have been extracted at very great disadvantage, and the works generally, from the same cause, have been performed in the reverse of an economical manner; and the cost of the new shaft of San Genaro, and the surface erections connected with it, have alone exceeded \$200,000. A very heavy outlay has also been incurred in numerous other buildings, the making of roads, &c., all indispensable works in the formation of an establishment of such an extent as this may easily be conceived to be; and the whole of this outlay has also been defrayed out of the above-mentioned produce. On the leading or champion lodes of the Zacatecas district, the better class of ores are rarely met with, until a depth of from 160 to 180 varas is reached; and from this point the lodes are usually productive to about 360 varas; such is the rule, although in some few instances, as in Veta Grande, they have occurred near the surface, and it is to be observed, that the deepest working on the San Eligio is but 140 varas, measured from the mouth of the San Fernando shaft. This consideration would of itself afford sufficient encouragement for the prosecution of deeper trials, even though nothing but the poorer sort of ore (colorados, as they are called) had been met with; but its character, as a productive lode, must be considered already fully established, by the experience of the last two years; and considering the comparatively insignificant extent of the trials hitherto made, all that is required is a steady and judicious application of the well directed efforts of this kind can hardly fail to be attended with signal success. It will be observed from the foregoing statement that the total amount of capital supplied by the company, and expended in the mine, is but \$26,387, an inadequate sum, it must be manifest, for such an undertaking; not exceeding, indeed, one-sixth of the amount required for working capital alone. In conclusion, the directors earnestly request the consideration of the proprietary to the statement of facts now laid before them; and in appealing to them for the means to enable the directors to carry on this promising undertaking with the vigour which, in their opinion, it so eminently deserves; and in the persuasion that the shareholders generally, on a review of the circumstances, cannot fail to hold the same opinion, the directors confidently hope that such appeal will not be made in vain.

The following is a statement of the assets and liabilities of the company in Mexico, in respect of El Bote, on the 24th March last:

Cash and bar silver	\$ 7,586 4 1
Ores on hand	474 6 1
Hacienda stores	6,621 6 3
General stores and cattle	8,895 2 1
Due from sundry persons	8,725 2 1
Claims on the Government	6,380 2 1
Deduct due to sundry persons	11,087 6 1
Inventories of stock and movables	327,593 4 1
	29,234 0 1
Total	\$ 36,829 5 1

In addition to which is the Bolanos stock, comprising two steam-engines and other machinery, the whole of which is now removed to Zacatecas; one of the engines being erected on El Bote mine. A point of the above assets might be converted into cash within a few months, but it would require, under present circumstances, a long time to realize the whole; and with reference to the largest item, under the head of inventories, it should be observed that in this is comprised the two haciendas of La Granja and Begona, both valuable properties to the company, while they continue to work El Bote; but owing to the other mines in the neighbourhood being at the present time generally unproductive, there is no demand for such establishments. The same may be said with still more force of the Bolanos stock, which, in the event of an investment, has been valued at a very considerable sum; by far the larger portion of which, at this time, for the reason above assigned, absolutely unsaleable at any price. The Bote mine must, therefore, be looked to as the best market, and it has been arranged that a valuation of the whole shall be taken, and the amount charged to the mine, by which the company will receive payment out of profits.

As another mail from Mexico may be expected previous to the general meeting, a postscript will, in all probability, be added to this report, and circulated after the meeting, together with the usual accounts for the year.

CONDURROW MINING COMPANY.

At a two-monthly meeting of adventurers, held at the mine, on the 18th inst., the accounts were examined and passed, showing—Balance to end of March, 1849. 19s. 8d.; ores sold, 2089r. 4s. 4d. = 2326r. 3s. 7d.—By labour cost, April and May, 1059r. 13s. 5d.; merchants' bills, 325r. 0s. 10d.; lord's dues, 104r. 9s. 8d.; dividend 3d. per share, 768r.—leaving balance in favour of the adventurers of 69r. 0s. 1d.—The following report was read to the meeting:—

June 18.—The 80 fm. level is in course of driving east and west of Pryce's shaft, and is extended about 100 fm. The lode is large, the wall thick, and the ore is rich. It is discovered 5 ft. wide, 4 ft. of which is very productive, yielding tin to the value of 50r. per fm. The 70 east has a promising lode, 2 ft. wide, worth 15r. per fm. for copper ore; in the 70 west there is a large promising lode, productive of tin—there are sundry pitches in this level working at 2s. and 5s. in 1r., and higher tributes. Hope's shaft is holed to the 60 fm. level, which level is 8 fm. east of the said shaft. The 50 fm. level is 9 ft. east of the same, and the 40 fm. level is 8 fm. In the course of six months these levels will be all driven under the workings, and we have no particular reason to expect an increase with respect to them, any other than that the lode is promising, and the ground is favourable for driving in all of them. Llandower lode continues its usual productiveness. The 30 east is in this very promising, and worth for tin and copper 18r. per fm.; and a wise sinking under this level is yielding some tin and ore, and has a large promising lode. There is a cross-cut in course of driving in the 40, east of Pryce's, to cut this lode, where it is distant about 4 fms.; it is probable, after we have seen this lode in this level, that we shall explore it, say, 60 fms. farther east, and also at deeper levels; and, should this be the case, it will be an important auxiliary, but not an essential one, to the increase in consequence. We are getting out more timber than we can return with our present machinery; but we are about erecting an eight-head stamps, and have put one of our small stamps in thorough repair, or rather have rebuilt it within the last few weeks—so that in the ensuing winter we shall greatly increase our returns of tin, probably to the extent of 40 per cent. After the new machine is in operation, if the ground should continue to open as productively in the 50 as at present, and as it has done from the 50 to the 70 fm. level, we may have to provide some other machinery for stamping. We are suffering severely from the depressed price of our produce—the fall in tin and copper having made a difference of 200r. per month to us.

STRAY PARK AND CAMBORNE VEAN MINING COMPANY.

At a general meeting of adventurers, held at the mines, on the 15th of June, a statement of the accounts for the four months ending the 30th of April, was presented, showing—

Jan. 1—Balance in hand	\$ 621 13 6
Feb. 1—Copper ore	1570 0 0
April 5—Ditto ditto	2204 2 0
Tinstuff	23 1 5
Tinstuff	23 1 5
Tinstuff	23 1 5
Merchants' bills	529 9 8
Tribute pay on ores sold, onist advanced, & lord's dues ..	1361 16 2
Proportion of Wm. Francis cost for 4 months ending April 30 ..	113 15 4
Balance	1852 11 7

Average gettings of miners during the above four months:—Tutworkmen, 2r. 9s. 6d. per month; tributaries, 2r. 12s. per month.

The accounts having been examined and passed, a dividend of 10s. per share was declared.—The following report was read to the meeting:—

June 15.—In the 80 end, driving west in Wheel Francis, the lode is small, containing stones of ore. In the 90 end, driving west in Wheel Francis, the lode is small, and unproductive. In the 100 end, driving west in Wheel Francis, the lode is 2 ft. wide, yielding 3 tons of ore per fm. In the 110 end, driving west, the lode is 1 1/2 ft. wide, yielding 1 ton of ore per fm. In the 120 end, driving west, the lode is 1 1/2 ft. wide, yielding 2 tons of ore per fm. In the 130 end, driving west, the lode is 1 foot wide, yielding 1 ton of ore per fm. In the 140 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 150 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 160 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 170 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 180 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 190 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 200 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 210 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 220 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 230 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 240 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 250 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 260 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 270 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 280 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 290 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 300 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 310 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 320 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 330 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 340 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 350 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 360 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 370 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 380 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 390 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 400 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 410 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 420 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 430 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 440 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 450 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 460 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 470 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 480 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 490 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 500 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 510 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 520 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 530 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 540 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 550 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 560 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 570 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 580 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 590 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 600 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 610 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 620 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 630 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 640 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 650 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 660 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 670 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 680 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 690 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 700 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 710 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 720 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 730 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 740 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 750 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 760 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 770 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 780 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 790 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 800 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 810 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 820 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 830 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 840 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 850 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 860 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 870 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 880 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 890 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 900 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 910 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 920 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 930 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 940 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 950 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 960 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 970 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 980 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 990 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1000 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1010 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1020 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1030 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1040 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1050 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1060 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1070 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1080 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1090 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1100 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1110 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1120 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1130 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1140 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1150 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1160 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1170 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1180 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1190 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1200 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1210 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1220 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1230 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1240 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1250 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1260 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1270 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1280 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1290 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1300 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1310 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1320 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1330 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1340 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1350 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1360 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1370 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1380 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1390 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1400 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1410 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1420 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1430 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1440 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1450 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1460 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1470 end, driving west, the lode is 2 feet wide, yielding 2 tons of ore per fm. In the 1480 end, driving west, the lode is 2 feet wide, yielding

IMPROVEMENTS IN STEAM-ENGINES.

VENTILATION OF MINES.—In the House of Lords, on Thursday, Lord Wharncliffe presented a petition from Mr. Richard Brian, praying to be heard before the committee on this subject.

The following are extracts from a letter written on the spot, dated also the 10th April, and from an entirely reliable source. The concluding remarks will show that the delay in the exportation of gold is not to be attributed to any disappointment regarding the quantities to be obtained by a very moderate amount of labour:—

"The climate here is anything but agreeable—proper March weather, with a cold blustering wind, piercing to the very bones. Wood is so enormously dear, that persons cannot afford to buy it to keep their houses comfortable, so that we have to sit with caps, hats, and great coats on, to keep ourselves from freezing. All descriptions of goods are now exceedingly low in San Francisco; and to give an idea of the unsettled state of trade, it will suffice to say, that the interest of money is from 3 to 5 per cent. per month. One singular point calling for remark is the safety of person and property in this place, and in the country generally. After what may have been heard to the contrary, the most honest and simple people are everywhere to be seen, without any apprehension of any kind here, in proportion to the property exposed to plunder, than in any considerable town in the United States. All descriptions of liquors, provisions (in packages), piece goods (in boxes and bales), wine (in boxes), &c., are, to a great extent, left out of doors unwatched, and yet it is rarely that loss occurs. The absence of crime is really surprising, but the explanation is, that every vagabond who is but willing to work, even moderately, need never be without his pocket filled with silver, or, I may say, with gold."

PROVIDING FRESH WATER AT SEA.—In the *Mining Journal* of the 2d inst., we noticed the exhibition before Prince Albert of a novel and highly ingenious chemical apparatus for producing fresh from salt water, which proved highly successful and satisfactory. For many years, numerous have been the experiments of scientific men to accomplish the object, but without effect; and the best apparatus hitherto in use is yet a distillatory one, manufactured by Mr. Grant; but it is highly probable the one above-named will soon supersede it, producing as it does large quantities of pure water by chemical action without distillation—a process which has been, for some length of time, attempted. The Lords of the Admiralty have given every encouragement on the subject; and three of her Majesty's ships, the *Arrogant*, *Plumper*, and *Reynard*, have recently sailed for their destination, furnished with the distilling and cooking apparatus, which, for the length of time required to keep up the cooking fires, gives one gallon of pure water per day to each individual on board. This water is thoroughly fit for drinking and culinary purposes, and is free from that mawkish, vapid taste, which characterises distilled water. It passes at once from the still into large iron tanks, where by the constant motion of the vessel agitating the water, a great portion is exposed to the atmosphere, from whence it imbues a sufficiency of carbonic acid to render it brisk as spring water. It is said that a series of interesting experiments are now being made by Mr. Crose, for the purpose of discovering a method of carbonising the water at the moment of distillation; by passing currents of electricity through the particles while passing into a state of condensation; by means of an extremely simple and self-acting apparatus; and we are informed the results are at present highly satisfactory.

Dreadful Accident at Edinburgh.—A shocking catastrophe, by which eight or nine men were killed, several dangerously wounded, and others severely mutilated, occurred on Wednesday evening at the railway bridge now building over the Teviot at Roxburgh, on the Kelsoe branch of the Edinburgh and Hawick Railway. The whole of the piers were up to their intended height, and the arches in course of formation. Two of the abutments at the north side of the river rest on the brink of a very deep quarry; over these the stones were being raised in the usual way, on which was a heavy and powerful crane for raising the stones from the quarry. The crane was being worked by a steam engine on the crane, and a number of others in the quarry, 80 or 90 feet below, when, without the slightest notice, the pier gave way with a sudden crash, precipitating the men, the crane, and the brickwork into the abyss below, and burying in rubbish those beneath. Numbers immediately rushed to the spot, and medical assistance was sent for; and after the living had been rescued, and the dead and dying taken out, it was found that eight men were killed, and several others severely injured. It is thought that the whole of the pier was blown up by the explosion of a small quantity of gunpowder, which was used for the purpose of blowing up the pier. No cause has yet been assigned for the falling of the piers and abutments; but which at the inquest will, doubtless, undergo a searching investigation.

PRICE OF COALS PER TON AT THE CLOSE OF THE MARKET

FRIDAY—Buddle's seed Hartley 14 3—Carr's Hartley 14 3—Adair's Main 12 6—Jollywell Main 18—Ord's Beddheugh 12 6—Ravenworth's West Hartley 13 6—Tunfield 4 9—West Hartley 14 3—Wall's Enc. Burnes 13 6—Bewickie and Co. 18—Gosforth 4 9—Hilde 14—Northumberland 14 3—Riddell's 14 6—Wharfedale 14—Eden Main 5 3—Lambton Farmhouse 15 3—Heiton 15 3—Carleton 15 3—Morrison 14 9—Russell's Barton 15 3—St. Andrew's 15 3—Thornliey 15—Camden 15 6—Hardislop 16 9—South 15 3—Skelton 15 3—Thornliey 15—Cowburn 15 3—Hawthorpe 15 3—Hill Top 15 3—Heiton 15—Derwentwater Hartley 14 3—West Hartley Netherland 14 3—Nixon's Merthor 6 0—Whitworth Coker 19—Killingworth 14.—Ships at market, 85; sold, 67.

IMPROVEMENTS IN STEAM-ENGINES.

[Specification of patent granted to Mr. John Penn, engineer, Greenwich, for certain improvements in steam-engines.]

The Mr. Penn's improvements in steam-engines are as follow—1. He places a float in the condenser, or in a separate vessel suitably connected therewith, which, as the water accumulates in it, from accidental or other causes, ascends proportionately. This float is connected to a stop-valve placed in the injection passage. The result of this arrangement is, that as the water accumulates in the condenser, and the float consequently ascends, the stop-valve will be partially or wholly closed, and the influx of the injection water regulated accordingly, whereby the passage of water to the steam cylinders will be prevented.—2. It is proposed to place in the steam passage leading from the boiler to the cylinders, a stop-valve, which will be worked by a lever, or other contrivance, so that, when further on in the same passage, in order that, as the boiler primes or the water boils over, a portion may be received into this vessel, which will descend by its increased gravity, and act upon the stop-valve, so as to partially or wholly close the passage of the steam to the cylinders, whereby the engine will be made to work at a slower rate, and any injurious effects of the boiler being primed, or the water boiling over, will be prevented. The water, is placed in the side of an auxiliary steam-vessel beneath the water-line, and is fitted with a small submerged horizontal paddle-wheel, which is keyed upon a vertical rod carrying a bevil wheel at top. This bevil wheel gears into another bevil wheel keyed upon the end of a horizontal cranked rod, fitted with a connecting rod, which works a double pair of weighted bellows. The bellows are employed as a means of regulating the flow of the steam, by combination of cams, weighted rods and levers, so that the expansion valves, or throttle valves, or dampers, so that as the speed of the wheel through the water increases, the velocity of the revolutions of the small paddle-wheel will increase also, and a greater quantity of air be driven into the top part of the bellows, which will consequently rise, and have the effect of regulating the passage of the steam to the cylinders. The bellows are provided with valves for regulating the quantity of air contained therein.

Claims.—1. The apparatus in marine steam-engines of a floater to the condenser, or separate vessel suitably connected thereto, and also of a stop-valve to the condenser or injection pipe; the two being so connected together that, as the water accumulates in the condenser, from accidental or other causes, the flow of the injection water thereto will be arrested, and the steam and water in the condenser or injection pipe will be expelled, and determine level.—2. The application in marine steam-engines of a suspended balanced vessel to the steam passage leading from the boiler to the steam cylinders, and also of a stop-valve a little further on in the same passage; the two being so connected together that, as the priming or boiling over takes place, the passage of steam to the cylinders shall be partially or wholly closed, and the speed of the engine reduced accordingly.—3. The application of the self-acting mechanical apparatus to sailing vessels propelled by wind, and which apparatus is made to work inversely to the speed of the vessel—that is to say, that as the speed of the vessel increases from the sailing power, the steam power shall be reduced accordingly, or *vice versa*, by means of this apparatus acting upon the expansion valves or throttle valves of the inductor passages, or the dampers of the furnace.

[Specification of patent granted to Mr. Wm. Clay, engineer, Clifton-lodge, Cumberland, for certain improvements in machinery for rolling iron or other metals; parts of which improvements are applicable to other machinery, in which cylinders or rollers are used.]

This invention has for its object to roll bars of iron, or other metal, into a tapering form of a wedge-like, or conical shape, and is caused by allowing the distance between the compression rollers to increase gradually and progressively as the rolling goes on.

1. The arrangement carrying this invention into effect, consists in making the bearings of the top compression roller moveable, instead of stationary, so that they may slide up and down in their standards. Upon the top of this moveable roller bears the lower end of a vertical rod, furnished with a piston at the upper end, which passes through a water and air-tight stuffing box, into the bottom of a cylinder. This cylinder is filled with water, or other non-elastic liquid, and is provided on either side with inflow and outflow valves. The rate of outflow of water from the cylinder is capable of being regulated to suit the circumstances of the case, and the inflow and outflow valves, the outflow valve is attached, so that as the liquid runs away, the piston, yielding to the pressure of the gas passing between the compressing rollers, will gradually and progressively rise up in the cylinder, and, consequently, allow the top roller to slide upwards in its bearings, whereby the distance between the two rollers will be gradually and progressively increased, and the desired taper given to the bar, the shape of which will depend upon that of the grooves. The top of the cylinder is provided with a safety-valve, loaded (by means of a spring) to a certain extent, so that in case the pressure should increase beyond it, the valve may open and allow the water to escape, and the piston to rise up to the top. The water in the cylinder is not to be used as a medium of power, and the machine, when used, the machine is not at work, by a coiled spring placed behind it, upon the spindle. It is proposed to apply the safety-valve arrangement to sugar-cane crushing, and other mills, in order to obviate the injurious effects of sudden shocks.

2. A modification of the preceding consists in substituting for the hydraulic apparatus a sliding frame which rests on the top of the vertical piston rod. Above this frame works an eccentric, or heart-shaped cam, keyed upon a shaft, so that as it revolves, the sliding frame will slide backwards, and allow of the top compressing roller doing the same. Rotary motion is communicated to the cam shaft from the bottom roller through the intervention of toothed gearing.

When it is desired to roll one portion of a bar tapering, and the remainder rotary, the piston rod is made to pass through a screw, capable of being adjusted to any convenient distance from the top of the upper compressing roller, and which catches against it, and thereby prevents the bar from rotating.

Claims.—1. The apparatus to rolling machinery in general (when such is required) of apparatus by which the bearings of one of the compression rollers are allowed to rise gradually in their standards to allow of taper forms being produced with the same facilities as parallel bars.—2. The construction, or arrangement and adaptation, of the hydraulic apparatus and appendages to machines for rolling iron and other metals, by which the shaping rollers are separated, so as to produce taper rod or bars by the rolling process.—3. The modification of the preceding, which consists in the employment of the eccentric, or the wedge-shaped roller, as a regulated means of separating the rollers for the purpose before-stated purpose.—4. The adjustable screw in combination with the apparatus, claimed under the second and third heads for rolling bars, tapering for a portion of their length, and parallel for the remaining part thereof.

H. M. Stowe, of Bermuda, master of the brig *James*, improvements in blocks and sheaves.
A. F. Campbell, Great Plumstead, Norfolk, for improvements in wheels, ploughs, and harrows, and in steam-boilers and machinery for propelling vessels.
W. C. Jacob, Bread-street, London, warehouseman, for improvements in the manufacture of parasols and umbrellas.
R. A. Brooman, of the firm of Messrs. J. C. Robertson and Co., of Fleet-street, London, patent agent, for improvements in apparatus for transferring liquids from one vessel to another, and for filling bottles and other vessels with liquids. (Being a communication.)
E. J. C. Smith, Greenwich, battery, for certain improvements in military accoutrements.
Col. Gustavus Adolphus Agassiz, Middlesex, for improvements in fire-arms.
E. L. Berthon, clerk, bachelor of arts, Fareham, Southampton, for an instrument to show the velocity of a ship or other vessel propelled through the water by wind, steam, or other moving power.

Sontheart and Alcock, Watling-street, portmanteau. [Goods.
J. Hardestie, Firwood, near Bolton-le-Moors, calender for finishing muslins and other
B. Urry, Newport, Isle of Wight, horse rake.
E. Spiller, Holborn-hill, bachelor's kettle.
W. Robinson, Leeds, mangling and wringing machine.
Robinson and Russell, Westminster-street, Dublin, arrangement of serpentine passages
and valves for cornpeans, &c.—*Mechanics' Magazine.*

We have, from time to time, noticed an invention in progress, by means of which written communications might be copied at any distance with much greater rapidity than they were written, and we are now enabled to state the mode by which this novel feat of electricity is accomplished. The decomposing power of electricity has long been applied for telegraphic purposes in different ways, and it is this power which the inventor of the copying telegraph has directed, so as to produce exact copies of writing or of print. The message is written with varnish instead of with ink, and on tinfoil instead of on paper. The message is then applied to a cylinder, whereon a metal point presses, which is so adjusted by means of a screw as to be carried gradually from one end of the cylinder to the other in the course of many revolutions. The point is connected with one pole of a voltaic battery, and the cylinder, or other pole, is therefore the electric circuit is completed through them. The copying instrument at the distant station is similar to the transmitting one, but a strip of paper, saturated with a solution which electricity will easily decompose, is placed on the cylinder instead of the tin foil message.

The electrical connects are the same in both instruments, and if they were put in action without any message being written on the foil, the point which presses on the paper would produce a succession of lines close together, running spirally round the cylinder. The varnish writing, however, interrupts the electric circuit, and the copying point ceases to mark whenever the point of the transmitting instrument passes over the letters. The thread of the screw which marks the point is sufficiently fine so that it is not perceptible when the point passes over a blank line, and the letters are formed on each time corresponding with the parts of the letters passed over, their forms are traced distinctly in a pale colour on a dark ground composed of numerous lines. The rapidity of the process seems to be equal to the rapidity with which the electrical power employed will decompose the solution, and when the cylinder is making 30 revolutions in a minute, which is the rate mentioned in the specification of the patent, about 400 letters per minute might be copied with a single telegraph wire. A much greater velocity, however, is said to be attainable; and by increasing the battery power in proportion to the velocity, the writing would not be less distinct. Were short-hand characters employed, the number of words transmitted in a given time would be at least quadrupled. As regards the success of the process, it is stated that the two instruments should make their rotations in equal times, and keep together throughout.

This great difficulty seems to have been overcome by employing an electro-magnet to start each instrument at intervals, regulated by the pendulum on a clock. On the rim of the cylinder there are four small projections at equal distances, against which projections a lever, fixed to the keeper of the electro-magnet, is made to rub when it is attracted. The electro-magnet is brought into action every half second, by causing the pendulum to make and break contact with a separate voltaic battery, and in this manner the instrument is regulated to the exact revolution of the cylinder. To enable the operator to adjust the distant pendulum to correspond, a wire, or pencil, is connected with the inventor's "guide line," is placed on the transmitting cylinder at right angles to the lines of writing, and if both pendulums are beating synchronously, a pale-coloured straight line, at right angles with the writing, is produced on the paper; but if one pendulum be beating faster than the other, the line will be inclined. In this manner the distant pendulum may be adjusted with the utmost accuracy.

The great rapidity of transmission attainable by the copying telegraph seems calculated materially to cheapen this mode of communication; for if with a single wire 400 words may be sent in a minute, and the same number may be sent by a multiplicity of wires without delay; and by reducing the expense of establishing telegraphic communication, one great cause of the present high charges would be removed.

It is proposed, indeed, by Mr. Blakewell, the inventor of the copying telegraph, to employ the facilities it affords for establishing a system of regular transmissions and deliveries every half hour between all the towns in a circuit, which plan would tend greatly to increase the certainty and to extend the use of telegraphic communications.

for throwing out of circuit all places but the one corresponded with; also for opening and closing communications with branch lines, so that with only a single wire, various ramifications from the main line may be placed in and out of circuit at the pleasure of the operator in London, or at any other station. — *Morning Post*

STOCK EXCHANGE. Saturday morning Eleven o'clock.

Bank Stock, 7 per Cent., 193 5	Belgian, 44 per Cent., 51
3 per Cent. Reduced Ann., 91 5	Dutch, 22 per Cent., 51 50
4 per Cent. Consols Ann., 92 5	Brazilian, 4 per Cent., 79 80
34 per Cent. Ann., 92 5	Chilian, 6 per Cent., 93
Long Annuities, 8 5	Mexican 5 per Cent., 30 5
India Stock, 104 per Cent., —	Russian, 5 per Cent., 103
3 per Cent. Consols for Opp. 91 5	Spanish, 5 per Cent., 165
Excheq. Bills, 1000f. 2d. & 14d. 43 5 pm.	Ditto 3 per Cent., 344

MINES.—During the past few days there has been a manifest improvement in the share market, and many shares have changed hands, especially in some of the leading and improving mines.

Improvements have been reported in Heigston Downs, Alfred Consols, and Mary Ann, and shares have, consequently, been in demand at former quotations, and in the latter especially an advance has taken place.

Cambodia Consols have been done at our present quotations, in anticipation of some important improvement being near at hand.

The directors of Tamar Consols, at their meeting, yesterday, declared a dividend of 10 per cent. Tincoft is represented to be looking remarkably well; 450 tons of copper ore were sampled on Wednesday, the next will be considerably more. In Esgair Lli and Cwm Erfin a large number of shares have found buyers, and the mines are represented to be progressively improving, and will evidently, from present prospects, become permanent mines.

The Welsh lead mines are stated to be generally in a very productive position, and some important discoveries are fully anticipated at Court Grange Mines (formerly Pen-y-Cefn.)

Bargains in the following mines have been effected since our last:—Devon Great Consols, West Caradon, South Basset, West Beller, Trilawny, Mary Ann, South Frances, Trebane, Tincroft, Esgair Lli, Cwm Erfin, Alfred Consols, Tamar Consols, Holmbush, Condurrow, East Tamar, South Tamar, Heignton Downs, Camborne Consols, Stray Park, Tregorden, Kingscott and Bedford, Ashburton United &c.

At the Stray Park and Camborne Vein meeting, the accounts show the returns for the four months ending April, at 3797*l.* 3*s.* 5*d.*, giving a profit of 680*l.* 18*s.* 1*d.*; balance in hand, 1252*l.* 11*s.* 7*d.* A dividend of 10*s.* per share was declared, leaving credit of 752*l.* 11*s.* 7*d.* to next account. The agent's report of the present and future prospects of the mine are highly encouraging;

but the present low standard precludes the possibility of giving large profits. At the Condundrow meeting, a dividend of 3 $\frac{1}{2}$ per share was declared; he balance in hand is 69 $\frac{1}{2}$. The manager's report is highly satisfactory. The 80 fm. level has improved, and the lode is now worth 50 $\frac{1}{2}$ per fm. for tin. The 79 east is worth 15 $\frac{1}{2}$ per fm. for copper, and the 80 east is also worth 15 $\frac{1}{2}$ per fm.; the pitches are working at a favourable tribute to the company, and the mine generally is looking well.

At the Whseal Sen meeting, the accounts show a profit of 238*l.* 15*s.* 11*d.* on March and April workings, which, with balance from last account, gives a credit of 407*l.* 19*s.* 4*d.* carried to next account. The prospects of the mine have considerably improved since the last meeting. The north caunter presents prospects of early improvement, the stopes over the end producing 15 tons of ore to the fathom. The 80 end is producing 8 tons, and the stopes in the back 12 tons per fathom. The stopes in the back of the 70, on the south part of the lode, are turning out 11 tons; the north part of the lode, which is not being taken away, will produce 6 tons more. The other levels and stopes are also productive, turning out 3 and 4 tons per fathom. A number of pitches in the various levels are worked on tribute, highly favourable to the adventurers. A great deal of dead work has been completed, and a charge of 500*l.*, caused by the erection of new steam-whim and crusher, is included in the above costs; and, notwithstanding the decline in the standard, the mine will shortly be in a position of reamoring her dividends.

At the Lelant Consols meeting, the accounts for four months, ending April, were audited, and a profit of 409*l.* 2*s.* 7*d.* shown to have been realised. The agent reports the mine to be now in a position of becoming permanent, although the present decline in the price of tin mitigates much against her returns. Additional force is being put on that part of the mine which is supposed to contain

At the East Pool meeting the accounts for April and May showed—Costs and merchants' bills, 1146*l.* 1*s.* 8*d.*; by ores sold, 1104*l.* 2*s.* 10*d.*; leaving a balance against the adventurers of 41*l.* 18*s.* 10*d.*

At the Trevean meeting, the accounts showed balance in favour of company, 55*l*. 17*s*. 11*d*., after deducting the debit from last account. By the death of Lady Carrington, the lease falls into the hands of her successor; and a committee was formed to negotiate with the present proprietor for a new lease, the company pledging themselves to erect a steam-engine, and sink the shaft to the depth of 40 fms.

At the Trewalden Mine meeting, a balance of 167l. 6s. 2d. appeared in favour of the company. From the highly-promising position of this mine, supported by the strong recommendation of their intelligent agent, the meeting resolved that a steam-engine be immediately erected, for the purpose of affording an efficient trial, to meet which a call of 2l. per share was deemed necessary.

At the Tremayne meeting, the accounts showed balance in hand of 323*l.* 8*s.* 7*d.* The fall in the market prices of tin and copper has made a difference in the receipts within the month to the extent of 500*l.*

In foreign mines brains have been effected in United Mexican, Imperial Brazilian, Guadalcana, Linares, St. John del Rey, Contape, and Bolance.

Dispatches were received yesterday from the Real del Monte, Bolanos, and United Mexican Mining Companies. From Real del Monte we learn that the property has been passed over from the old company, in England, to purchasers in Mexico; and it appears that had the shareholders come forward and supported the new company, proposed to be formed in March last, they would now have begun to reap the benefit. The mines have been improving for some months, and there is every prospect of their becoming again as productive as in earlier and prosperous times.

The Bolanos advice are to the 4th of May. In the El Bote Mine there has been nothing discovered of any importance, but considerable exploratory works have been carried on, an engine erected, which performs well, and other surface work completed. In Celestina an improvement of such interest had taken place, as to prevent, at least for the time, the abandonment of the mine. From the directors' report, to be read at the forthcoming meeting (which will be found in another column), it will be seen that further subscriptions will be required to carry on the works; and, as the prospect of the mine is not so brilliant as it was some time since, it is probable that the directors will have to make some such announcement in the near future.

The advices from the United Mexican are to 7th May. The improved condition of the mine had continued, and the last monthly returns had exceeded the expenditure by \$9219, besides covering the deficit of the former month of \$1792. Jesus and Purisima had somewhat deteriorated; but the more important point of Santo Toribio had given higher and yet more promising produce. The workings of the new mines of Aldama and Fremontorio were progressing satisfactorily.

The Royal Mail steam-ship, *Severn*, arrived on Thursday, bringing the West India and Mexican mails, and on freight \$675,995 on merchants' account, \$8161 for account of the Mexican bondholders, gold coin, value 260*l.*, and bars of silver, value \$3390—total value of specie about 140,000*l.* The brig, *Topic*, arrived at Liverpool, on Thursday, from California and Valparaiso, having on freight gold to the amount of \$60,000.

REAL DEL MONTE MINES.—In our Mining Correspondence there is a letter from the agent of the Real del Monte Company in Mexico, announcing the receipt of the directors' acceptance of the terms offered by parties in Mexico for the whole of the company's property. The mines, we understand, have continued improving for several months past, so that no doubt exists of their becoming very profitable to the purchasers. It is matter of regret, that the shareholders of the old company could not be induced to come forward to the support of the concern when they were invited to do so in the month of March last, and thus have secured to themselves those profits which will now be reaped by others, who, being on the spot, have the opportunity of convincing themselves of the truth of the reports relative to the mines.

COURT OF EXCHEQUER, WESTMINSTER—TOLL v. LEE.—This case, which was tried before Lord Denman at the late Bodmin assizes, involving the important point to the mining interest, whether a stamp or certificate is necessary for the transfer of a share, was not brought before the court previous to our going to press to-day; we, therefore, are unable, as we anticipated, to report the argument of the learned counsel and the judge's decision. A full report will appear in our next Journal.

AUSTRALIAN PRODUCE—The vessel *Colonist*, from Hobart Town, has brought 72 bags of wheat as a portion of her cargo, of Australian produce. The same vessel has also on board 8800 hams—an unusual and interesting description of importation from Australia, the produce of that distant, but important colony. The barque, *Ann Smith*, has arrived at Swansea from Port Adelaide, bringing 818 tons of copper ore, 15 tons of bark, one box of specimens, and a quantity of timber for ships, the produce of Van Diemen's Land.

DUCHY OF CORNWALL.—In the House of Commons, last night, in answer to Mr. Trelawny, the Earl of Lincoln said, the county of Devon had been expressly exempted from the provisions of the bill he had introduced relating to the duchy of Cornwall; and this had been done at the request of several gentlemen connected with the county. There was no disposition on the part of the council of the duchy to re-open the question, and it would not be done, unless on an unanimous application from the county.

NOTICES TO CORRESPONDENTS.

* We must impress upon our correspondents, the necessity of invariably furnishing us with their names and addresses—not that their communications should, consequently, be noticed, but as an earnest to us of their good faith.

"W. A. T." (Oxford-street).—No sufficiently certain data have yet been obtained to ascertain the power developed by North's electro-magnetic engine. Considerable modifications are being made, by which even the present incomplete engine will be made to exhibit far greater power; but an engine of much greater capabilities is about to be constructed, for actual mechanical operation, in which the patentee informs us he has not the slightest doubt of establishing the power and economy of the system. On our last visit to the model, the engine was making, probably, about 20 revolutions per minute.

"A. B." (South Wales).—Will any of your correspondents be kind enough to favour us with their opinions as to the best mode of putting dams into drifts in mines, for the purpose of stopping back water? This is a subject which, it would appear, is little understood; for in three different cases which have come under my notice, in different parts of England, where dams have been applied for this purpose, they have been ineffective.

"S. B. R." (Nantyglo).—Mr. Manly has two patents for improvements in furnaces in 1841, but does not appear to have taken any since. Copies of specifications in full can be procured from the Chancery Offices, in which these documents are enrolled. Of these there are three—the Enrolment Office, the Petty Bag, and the Rolls' Chapel Office—all in Chancery-lane. The officials will not attend to applications by letter. Our correspondent had better apply to Mr. F. W. Campin, patent office, corner of Essex-street, Strand, London.

"L."—There is no work of the kind published.—See the series of papers, which occasionally appear in our Journal, entitled the "Compendium of British Mining."

"Anglesey."—No returns have been published of the different consumption of coals in the Railway and Government boats. We have made inquiries, but without success.

"W. V." (City).—The sale of the Midium Colliery Works was fixed for the 20th inst., in the vicinity of Drammam. The result of the auction will, in due time, appear in our columns.

"Hermes" (Liverpool).—We have never doubted the existence of gold in many substances, both mineral and vegetable, where it seems improbable it could be formed. The statement of Mr. Robert Hunt, at the Royal Institution, quoted by you, that a friend of his had discovered a minute quantity of gold in the blue petals of the violet, we are willing to give all due credence to. Gold is known, after iron and manganese, to be the most universally diffused metal, though in minute quantities. We by no means sneer at the experiments of our correspondents, but must doubt the possibility of forming or discovering an organic substance where it does not exist.

"Bourgeois."—A long account of the causes and effects of lightning is given in the *Encyclopædia Britannica*, under the article "Electricity."

W. Smith (Kensington) shall be answered in our next.

"C. & B." (Gloucester Iron-Works).—Mr. John Beverley published an account of an effluvia trap in No. 1231, Feb. 10, of *Mechanics Magazine*, the invention of which was subsequently claimed by Mr. John Phillips, of Greek-street, as registered by him in August, 1849. The effluvia trap, patented and manufactured by Mr. J. Walker, of Shoe-lane, is extensively used in London. No patents for stretch traps, we believe, were registered in February last. Any information on the registration of patents can be obtained from Mr. F. Campin, 310, Strand.

Professor Loomis, (Princeton, U. S.).—A concise chronological history of the science of electricity, from its discovery until its successful adaptation to telegraphs, by Professor Morse, was published in the *Mining Journal*, of the 3d July, 1847. In the *Transactions of the Royal Society*, the *Encyclopædia Britannica*, and the *Oxford Encyclopædia*, a great deal of information will be found under the head "Electricity." We have not seen any other account of Mr. Ronald's experiments than that published in the *Encyclopædia Americana*; we shall refer to the works which we have access to, and transmit any information which may prove useful. In our Journal of the 23d inst., there is a report of a paper read at the Society of Arts on an electric telegraph, invented by Mr. E. W. Siemens, of Berlin, and which is now in successful operation.

"B. W." (St. John's Wood).—We know nothing of the mine, its prospects, or management, beyond what appears in the Journal; as published in the Journal; apply to some mine agent, who may, perhaps, be able to give you information.

"An Enquirer" (Cheltenham).—The length of the Red Sea from Babel Mandel to Suez is 1200 miles; its average breadth is about 115 miles.

"An Engineering Pupil" (Greenwich).—It takes 966 lbs. of air to produce the combustion of hydrogen and carbon contained in 100 lbs. of coal. The products resulting from such combustion, according to Mr. Craddock's experiments, were 47 lbs. of steam, 332 lbs. carbonic acid gas, together with 690 lbs. of nitrogen.

"Miner" (Redruth).—The copper mine worked by the American company in Cuba is situated at Santa Clara. Bitumen, asphalt, marble, and Jasper, are also found in Cuba.

W. Brown (Penzance).—The mineral produce of Chili has been greatly developed since the independence of the Republic. During the period it was a Spanish colony, the average annual produce was—Silver, 23,500 marcs; copper, 25,000 cwts. In 1834, a few years after the stable formation of the republican Government, the produce of silver was 164,000 marcs; of copper, 75,000 cwts.

"A Marine Engineer" (Blackwall).—There are at present five steamers belonging to the East India Government navigating the Ganges—viz. the *Benares*, the *Palma*, the *Champan*, the *Mysore*, and the *Ganges*. According to Mr. Macgregor, their cost is—steam-engine (820 horse power), £1,500; vessel, cabins, &c., £9,500; transportation to India, £575; reconstruction and equipment, £199—making a total cost of 96,560. They are partly supplied with English coal, which costs at Calcutta from 30s. to 33s. per ton. Supplies of coal are likewise obtained from the mines of Burdwan, situated 63 miles from Calcutta; it is brought thither by the Damoodie river; it is delivered in Calcutta for 20s. per ton, but is much inferior to English coal.

H. Crosbie (Queen-street).—An easy method to prevent the corrosion of metals, is to dip them in diluted nitric acid, afterwards to immerse them in linseed oil, allowing the superfluity of oil to drain off. This will generally preserve them from oxidation.

"L. G." (Widham).—It is supposed about 15,000,000. is invested in the different gas-works in the United Kingdom.

"A Reader" (Curnhill).—The migrating stone, or "Wanderstein," of the Riesengebirge, stands in the Agnetendel, near the village of that name. It is composed of quartz, red felspar, and a slight admixture of mica. Its migrations occur not on a slope, but perfectly level ground. It moved in 1822, between the 18th and 20th July, 1848, it again moved about 25 yards from its former place. Geologists are unable to account for the causes which repeatedly force this rock to make such violent leaps. The most reasonable theory is, that it is a boulder stone. Many of these are found on the plains of Germany, which bear every evidence of Scandinavian origin.

James Rowe (Liverpool).—The island of Ceylon is a British dependency. Tin and anthracite have been found in the vicinity of Safragan. Quicksilver has been found in other parts of the island, but in inconsiderable quantities. There are mines of plumbago at Calcutra, which are now of some importance; the produce in 1840 was 981 cwts., of the value of 1222. 10s. id.; in 1846, this had increased 25,036 cwts., of the value of 80865. 2s. 5d.

J. Wilson (Ilkington).—According to all received accounts, the Marquis of Worcester was the first who brought the action of steam into practical utility. We are not aware that there are any drawings extant of this machine. One of these engines appears to have been set up to draw water out of the Thames at Vauxhall, and is thus spoken of by Cosmo de Medici, who inspected it in 1653:—"It raises water more than 40 geometrical feet, by the power of one man only, and in a very short space of time will draw up four vessels of water, through a tube, or channel, not more than a span in width, on which account it is considered to be of greater service to the public than the other machine, near Somerset House," which was last year driven by two horses. From this account, it would appear that the atmospheric pressure was employed in this engine, for it is difficult to see by what power other than suction, the necessary rapidity of motion could be given to the water in the pipe leading from the river to the engine, and which would appear to be smaller than the pipes applied in other cases.

"L. B. E." (Redruth).—"Ganekothig Erz," or "goose-dung ore" is an arseniate of silver and iron. It is found in irregular mammillated translucent masses, of a yellow or pale green, shining, with a white streak, sometimes earthy and mixed with cobalt. Before the blow-pipe it emits copious arsenical fumes, and fuses into a blackish scoria. When the heat is continued, on charcoal, it melts, diminishes in bulk, and yields a button of silver; but the slag contains magnetic iron, which strongly affects the magnet. Its principal localities are the mines of Glanville, in the Harz. When obtained in sufficient quantities, it is highly prized as an ore of silver. It is also occasionally met with in Cornwall, and at Allentown, in Dauphiné.

"X." (Newcastle-on-Tyne).—M. Lafont is the naval officer who has taken out a patent in France for a new engine, in which chloroform, in conjunction with steam, is the motive-power.

"A Speculator" (Glasgow).—There is but one iron foundry in Brazil; this is situated at Ypanema, at the foot of the Guayana mountains; it belongs to the Government. The ores are those of magnetic iron. The principal castings are wheels and cylinders for sugar houses. There are lead mines at Cuyabara, west of Capao; near Prula, red lead ore, and green chromate of iron is found. From 1801 to 1806, the expense of working the diamond washings was 204,000, and the diamonds sent to the treasury at Rio de Janeiro weighed 118,679 carats.

"M. E." (Chester).—Glass is a combination of silica with fixed alkali. Soda is the alkali in general employed. The mixture is melted in a furnace, and is called "frit." It is then, after complete fusion, it becomes glass metal, and the extraneous salts which float on its surface are named "glassball." When formed in the required shapes, it is annealed, or tempered, by being placed in a furnace of an appropriate heat. The fineness of the glass depends on the purity and proportion of the ingredients. A fine crystal glass may be obtained from 16 parts of quartz, 5 parts of pure potash, 6 parts of calcined borax, 3 parts of flake white, and 1 part of nitre. By an over proportion of alkali (4 to 1, for instance) the glass will become soluble in water, and even deliquescent. Thus dissolved, it is called "liquor silicæ," or liquor of flints. Professor Steglitz having laid a bottle of this liquor undisturbed eight years, found transparent rock crystals formed in it, which gave fire with steel. From this solution pure silica may be precipitated, by the addition of any acid.

"A Subscriber" (Hull).—The only railroad in Denmark Proper is that from Copenhagen to Roskilde. The Altona and Kiel line is in the duchy of Holstein. They are both scrip companies, but under the control and guarantee of the State. There have been railroads projected in Norway and Sweden, but it is questionable whether they will ever be carried out, if English capital is required.

"T. M." (Swansea).—The peculiarity of Mr. John Jacke's patent furnace consists in placing the fuel on an endless chain, situated between two rollers, so that a movement is given by the engine, and which receives the coal at the furnace mouth, and delivers the clinkers and ashes at the other end of the furnace. This is a good plan in many respects, but the mechanism, we fear, must be very expensive to keep in repair. The endless chain of fire-bricks, carried on rollers, are carried on a wheeled frame running on rails, so that the fire may be at any time withdrawn altogether from beneath the boiler. The furnace door is of that description which slides up and down, and the degree of the depression regulates the thickness of the coal on the bars of the grate.

"A Student" (King's College).—Aqua regia is formed by the mixture of the nitric and muriatic acids, in the proportion of two parts of the former and one of the latter. Four ounces of sal ammoniac, dissolved gradually in the acid, in 1 lb. of nitric acid, forms an aqua regia. The muriatic acid in these processes attaches to itself a portion of the oxygen from the nitric acid, and thus oxygenated, escapes in a yellow fume, whilst the nitrous gas which belonged to the nitric acid thus deprived of its oxygen, is absorbed by the unaltered portion of nitric acid, which is discoloured, and changed to nitrous, thus forming a mixture of muriatic and nitrous acid. The nitro-muriatic acid of a yellow colour, and its specific gravity is less than that of either of the acids employed. It readily dissolves gold, which is not done by either of the other acids of which it is composed. It is employed by dyers for the solution of tin, which, when states, nitric acid corrodes and oxidises, without dissolving.

* It is particularly requested, that all communications may be addressed—

TO THE EDITOR.

Mining Journal Office,

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THE MINING JOURNAL

Railway and Commercial Gazette.

LONDON, JUNE 23, 1849.

The MINING JOURNAL is published at about Eleven o'clock on Saturday morning, at the office, 26, Fleet-street, and can be obtained, before Twelve, of all news agents, at the Royal Exchange, and other parts of London.

Next after the mines of Cornwall, we have long regarded its railways as the most vital and important of its public works. The improvement of its harbours, the enlargement of its fisheries, the sanatory organisation of its towns are truly, in the language of Lord Bacon, great and heroic works; but there is probably neither of them which, on account of the immediate utility and profit connected with their advancement, could stand an hour in the same category as a well-arranged system of county railways. Although, perhaps, not more unfortunate than some other counties, still Cornwall has been very unfortunate in this class of works. The failure, a few years since, in making out a case to Parliament for a great central line, was a heavy blow and sad discouragement to the material prosperity of the district. We deeply deplored it, and continue to be perfectly convinced that such a line as Parliament could not then be prevailed upon to concede, is the only one worth the acceptance of the county, or commensurate with its actual wants. An important, though a fragmentary, group of lines, is situated lower down in the county, and we see it is proposed to give greater unity and connection to these railway pieces, by constructing a line from Hayle to Penzance, and by that means opening up a short and practicable highway between the two sides of the county and the two channels.

We need not say that we wish all prosperity and success to this highly reasonable and promising undertaking. It is generally known that the district below Truro considerably surpasses the district above, in the number of its population and the value of its mining produce; and on that account it is of all the more importance that it should not be wanting in any known element which is likely to assist the development of its resources, or the convenience of its thronging inhabitants. It would appear by their statement, that Mr. Mowatt coquetted for the purchase of some of the shares, and for a share in the direction of one of these companies, and that afterwards he declined either to receive the one or to accept the other. There is not the least occasion that we should pretend to judge between the parties, but it must be plain to the most inattentive observer, that the gentlemen in question had incurred no actual liability to be fixed with any of the shares which he was supposed to have virtually purchased. He is perfectly free to take his own course; and though the directors may justly regret that they miss in him a man of business and ability, yet they need not fear that their task calls for any greater industry and address than that which they have already exhibited, and which we believe the shareholders, as a body, are most cheerfully willing to acknowledge.

[FROM A CORRESPONDENT.]

The remarks in the MINING JOURNAL of last week, on the subject of the sales of Banca tin, which will take place at Amsterdam and Rotterdam, on the 2d of August next, are calculated to cause needless apprehension to parties who have capital invested in tin mines, as well as those whose daily bread has to be earned by this branch of mining industry. At the very commencement of the article it would lead to the belief, by those who may not be acquainted with the subject, that foreign tin is admitted into this country free; such, however, is not the case, all blocks, ingots, bars, and slabs, are subject to a duty of 6s. per cwt., with an addition of 5 per cent., and the same from British possessions of 3s. per cwt.—a sum amply sufficient to protect the Cornish tin miner, when it is remembered that half the circumference of the globe has to be traversed, to bring Banca tin to the Dutch market. It is also stated—"The Dutch Government, on the present occasion, are putting forward double the ordinary quantity submitted at the annual sales, being not only the produce of the past 12 months, but the accumulation, or surplus, of many years; they have very prudently heretofore confined their sales to the demand, so as not to deteriorate the price, and create a falling market by any announcement of a surplus, as is the present case." Now, although 250,000 slabs appear a large quantity, it is impossible to say what the demand may be in the course of the succeeding year, the notice from the directors of the Maatschappij, at Amsterdam, stating that they will not sell any more before the month of August, 1850, and that until that date there will be no sale in Dutch India, nor will any tin be sent to China for account of the Government. Any quantity which may be withdrawn from the approaching sale cannot be secured before the next sale in August, 1850, under the selling price of August, 1849. The stocks of tin, as stated in the City article last week, are very low, and it is highly probable that although the quantity of Banca for sale appears large, under all the circumstances it will turn out only sufficient for the increasing demand in the European and American markets.

In another column will be found a communication from our respected correspondent, "The Black Diamond," in which he expresses "surprise at our commendations of the bill lately introduced for the better regulation of coal mines." Now, although it is true we casually remarked that it "appears to be well adapted for the evils it is intended to cure," that expression applied to the general principles of the bill, and not to its details, many of which, we are perfectly aware, with our correspondent, must undergo considerable modification, and some of the clauses probably be entirely expunged, before it can with safety become the law of the land. That much care has been bestowed in the drawing up of the bill any one who reads it must acknowledge, and the very introduction of what our correspondent designates as the objectionable matter is evidence to the fact; although we are of his opinion that practical experience has not been sufficiently consulted. We never, however, remember a bill intended for the public advantage, and affecting any individual interest, that was found perfect until full discussion on the clauses had taken place, or that, in its most complete state, some cavillers were not found to oppose it, as a measure interfering with private property and vested rights. Nor do we think the points of objection chosen by "The Black Diamond" by any means happy; for we consider that weekly payments, and paying the men separately, would prove advantages to the working collier to which he is justly entitled. We are aware of the objections urged that the colliers are reckless, and would always lose a day or two in the week, if paid weekly, and that the very nature of the employment, the work having to be settled for when finished, prevents it; but each man must be responsible for his own acts, and if he will neglect his work he suffers for it. Why not compel the butty, or coal contractor, or agent, to advance a reasonable sum weekly, by way of subsist? This would save the collier many a shilling in purchasing provisions. Every other working class is paid weekly, enabling them to go to a far better market with ready money, than they can possibly do when obliged to obtain necessities on a fortnight's credit; and, in many cases, the paying men in groups is only done to secure their attendance at the butty's or agent's beer-house; while, as each man paid separately, many a steady fellow would keep away, and go straight home with his money. The means to accomplish this are most easy, and could not be, as our correspondent states, "attended with great inconvenience," it being only necessary to obtain, previous to pay-day, a sufficient amount of cash in the necessarily small change—an attainment we expect within the reach of every colliery owner. The clause enacting that wages shall be paid by weight instead of measure, we leave to more practical hands

than ourselves, but confess we cannot see that much difference could arise to the working man by the adoption of the former to the rejection of the latter plan; for, as coal varies considerably in the production of its proportion of refuse, measurement of the cubic quantity cut out, certainly appears to us the most advantageous for the miner. On Tuesday evening last, in the House of Lords, we had an instance of the fact that, to the best intentioned and unobtrusive measures there will always be found some one ready to step in and place every obstacle in his power to their being carried out. The Marquis of Londonderry, a large coal owner, objected to his name being on Lord Wharnclyffe's committee, stating that thorough investigation had taken place on explosions in coal mines, and that nothing further could be elicited by such committee. Now it is evident, we think, this is somewhat of a subterfuge to hide a more decided feeling of opposition. Lord Wharnclyffe's motion, which was carried on Monday evening, was for a committee to consider the best means to be adopted to prevent a recurrence of such awful explosions, and not to inquire into their nature and cause—a subject which, although fully discussed and decided upon 14 years since, and during which period several really efficient plans of ventilation have been proved to be within reach, only about three or four colliery proprietors have availed themselves of the advantages of scientific discoveries, and the workings are followed on the same crude, dangerous, wasteful, and unscientific plan as they were a century ago. On this subject we refer our readers to a communication, in another column, from Mr. Richardson, of Neath.

It is not then, we think, too much to press for the passing of some such measure as that introduced by Mr. Hume, whereby the lives of the working colliery population may be placed in somewhat greater safety, when we find the proprietors of coal mines so careless of their welfare. The objectionable clauses will be, doubtless, modified, altered, or expunged in committee, as may be necessary; and we are as averse to interfering unnecessarily, or to the adoption of compulsory measures, as our correspondent can be, provided it is possible to effect an object of such manifest importance by other and milder measures.

Although we have on all occasions invariably recommended the investment of British capital in our home mines, where all parties interested can at any time, at a trifling cost, inspect the undertaking in which they have embarked their money, and early discover and reform any errors which may have crept into the management of those establishments, in preference to risking it in dubious enterprises in foreign countries, situated at a distance from our own shores—in many instances brought forward under the auspices of speculative and interested projectors, or by sanguine and enthusiastic individuals, possessed of no mining knowledge, but solely guided by the inflated reports and loose oral traditions they have gathered on the spot; where capital, once subscribed, the shareholders at a distance must necessarily depend upon the report of the agent, who if, as unfortunately has often been the case, should happen to be an incompetent person, leads them into all manner of errors and difficulties, wastefully expending their capital, in the hopes of a lucky turn in Fortune's wheel, to retrieve the consequences of his incapacity. Unfortunately, the general body of shareholders are not the only parties who are in the dark as to their real position. In many instances the board of directors are generally appointed from their commercial standing; and none are enabled, even were they willing to undergo the risk and fatigue of a sea voyage (from their other avocations), to afford the time for a personal inspection of the property they have undertaken to manage. The general result is that, from a variety of opinions, different parties are formed in the board room, which lead to bickering, angry discussions, and, in many instances, a dissolution of the company, with a total loss of the capital embarked—at a period when, perhaps, brighter prospects were dawning, and some hopes could be entertained of a profitable return. We have always manifested a great interest in mining enterprises wherever they have been undertaken, more especially those in which British capital has been embarked, though we candidly confess we would rather see it expended at home in developing our own mineral resources, and conferring employment on our labourers, than being employed to enrich foreigners. The lamentable and never-to-be-forgotten year, 1825, was particularly rife in foreign mining speculations. We are afraid to say how many companies were started, and how many of those are now in existence. We ask, where are they? and echo answers, where? The causes which lead to their abandonment are multifarious; and, if we were to analyse them, the list would occupy too much of our space, which we can ill spare to such a long-forgotten subject. In many instances they were entirely worthless—got up as the bubbles of the day; as quickly blown—as swiftly burst. In others, litigation, disputed rights, quarrels, and a variety of other causes, terminated their short-lived career; while some, which offered fairer prospects, were situated in localities where no population or roads existed; and colonisation, and its concomitant cost, would have entailed such enormous expenses, that to have commenced these Herculean enterprises would have been the height of madness, or something worse. It is gratifying, while we are looking at the dark shade of the picture, to find in relief a little light. Some few of the mines then commenced are still in existence; and if not rejoicing in a most flourishing condition, are at least pursuing a healthy and sound career. Among these the Alton Mines (though they have had severe trials to undergo, and difficult struggles to encounter, in the varied phase of their existence) show that union and perseverance can withstand shocks which, for want of those qualities, have overwhelmed establishments which were ushered to the world with brighter prospects and more favourable auspices.

These mines, which were discovered by the Danes, in the latter end of the 17th century, and partially worked by them for a short period, then abandoned, were taken up by two English merchants (settled at the port of Hammerfest), in the year 1826; they were worked by them for the first seven years of their existence, and when several thousand tons of ore had been raised, in 1833, the present company was formed to work them. Situated in a barren locality, within the north frigid zone, where the winter occupies eight months of the year, and during which period the sun is two months below the horizon, the proprietors had no ordinary difficulties to combat against; the population had to be imported from different and distant regions, houses to be built for them, and a complete colony formed at the expense of the mine. This, combined with the obstacles they encountered previous to bringing their smelting establishment to a state of efficiency, and the too frequent error of declaring dividends too soon, cramped their resources, and caused a sudden depreciation in the value of the property, which was not warranted by existing circumstances. In the year 1845, the establishment was greatly reduced, and the expenditure considerably lessened; from the reports of all the mining agents who have been there, it appears there is no doubt that lodes exist in the vicinity of the present workings not yet touched, and that some of the old workings, if developed with greater spirit, would more than repay their cost; economy has, however, been the order of the day, and no doubt the directors, in giving such orders did not do so without due consideration, and a conviction that it has been for the general good of the concern. We do not wish in any way to dictate to those who probably are better able to judge of this particular subject than ourselves, but we would suggest whether, having their plant so conveniently situated, and their machinery and smelting establishment in so efficient a condition, where no more capital is required to be sunk, that a small sum might be raised for the discovery of new lodes, and the development and unwatering of some of the most worthy of the old workings. The acquisition of the mines at Quensenang, and the facility of transporting and smelting those ores at Alton, will, we have no doubt, be a source of profit to the shareholders. We are glad to see the present talented manager (Mr. Thomas) has introduced the tribute system in both places, and that the results have been such as to justify his anticipations, and we have no doubt that such assimilations to our method of mining as found practicable, will be introduced by that gentleman, whenever the fitting opportunity and proper season occur. The Alton Mines, though suffering under the depreciation of the times, have always afforded fair prospects of remuneration, and had it not been for the heavy capital unavoidably obliged to be sunk for the purposes above alluded to, would long since have given a remunerative profit. We have never despaired of their ultimately being a profitable and prosperous concern. The last reports received, show the produce to be in excess of the estimates; we hope that this is the beginning of a favourable turn in the prospects of the mines, and the next advices will, we trust, further confirm this favourable news, so that we may not be mistaken, when we prophesy to those interested in the welfare of the Alton Company—"There's a good time coming, wait a little longer."

FOREIGN INTELLIGENCE.

From accounts we have received from Hamburg, it appears that the metal trade in that town is at present in a very depressed state. The Elbe Copper Works, which consumed about 6000 tons of coal annually, have, at present, but a very trifling stock. They have lately been smelting old slags, and refuse, the regular business of the establishment having been suspended since the commencement of May, owing to a deficiency in the supply of ores caused by the blockade. A vessel laden with 400 tons of Chili is now lying in one of our southern ports; several others are expected. The proprietors were in hopes that, by ordering their cargoes to England, they would have been able to have transhipped them to Hamburg in British bottoms; this belief they were led to indulge, by perceiving that the Danish cruisers had allowed several Dutch and French vessels to evade the blockade. The detention of the Hull steamer has, however, undeceived them, and the parties commercially connected with England complain of the undue preference shown to those favoured nations. The iron foundries at Hamburg, Altona, and Wandbeck, who have received their material from England, have been for some time working on a reduced scale. While the want of coal is felt most severely by the smaller manufacturers, the Prussian Government have been obliged to suspend several of their establishments, not being able to receive the usual supply of fuel from Hamburg. The Saxon and Hanoverian mining establishments, as well as those carried on in the minor states of Germany, of which the Elbe is the outlet, are beginning to feel the effects of this depression, though in a less degree.

Advices from Trieste state that the Imperial Directory of the mines of Austria has officially announced that quicksilver and cinnabar may be purchased at the following prices:—Quicksilver at 288 fl. per cwt., with a premium of 10 per cent., to be returned upon its export abroad, without respect to quantity. Cinnabar, in lumps, at 218 fl., and ground 223 fl., and in cases of 1 lb. 288 fl. Upon the latter no export premium allowed, and only the customary discount.

An instalment of silver in bars has arrived in Madrid, for account of the Bank of San Fernando, from the works at the Sierra Almagrera, which it is intended to convert into coin at the Mint.

PORT PHILIP.—The advices from Port Philip are to the 10th February, one week later than our last. The excitement relative to the discovery of gold in the district of the Pyrenees was beginning to abate a little, as the first party who went in quest of the spot had returned without having accomplished their object; and the shepherd, who was the first to discover the precious metal, had disappeared, no one knew where, and without him it does not appear that any one of the explorers had as yet been able to hit upon the precise locality where the only existing specimens were originally picked up, and which were found to yield 95 per cent. of pure gold. The Commissioner of Crown Lands for the district had been directed to proceed to the place, with the requisite accompaniment of assistants.

The Royal Mail steam-ship, *Severn*, Captain W. Vincent, arrived at Southampton, on Thursday afternoon, with the usual British and Foreign West India and Mexican mails. The *Severn* brings on freight \$675,995 on merchants' account, and \$8161 for account of the Mexican bondholders; gold coin, value 260l.; bars of silver, value \$3390; total value of specie about 140,000l. sterling. Also 494 serons of cochineal, 5 serons of jalap, 51 cases of cigars, 26 bales of tobacco, 4 cases of vanilla, 6 cases of pines, 32 cases of arrowroot, 20 live turtle, 3 cases of succades, and 70 packages of sundries. The advices received by the Mexican mining companies will be found under the heading "Foreign Mines."

The roads from Vera Cruz to Mazatlan were lined with travellers to California—a perpetual stream of emigrants and adventurers, travelling by every conceivable mode of conveyance—in waggon, carts, on horses, mules, and even on foot; some without shoes or hats, and short of the necessities of life; all alike pressing onward, intent upon reaching the gold regions of the west.

NEW YORK, JUNE 5.—The *Lexington* is expected here every day with consignments of gold. A great many persons have lately arrived, principally overland, with considerable quantities of gold. The \$200,000 brought by the *Oregon* to Panama, are expected, per the *Crescent City*, in about a week, when it is believed a stream of the precious metal will continue to flow in, and cause a large exportation of manufactured goods in return. Every steamer from the American ports to Chagres continues to take out specie, goods, and various ventures for California; among them are bowie knives, and all kinds of arms, domestic utensils, and agricultural implements.

The following public companies have declared half-yearly dividends:—New York and Erie Railway Company, 5 per cent. interest; the Gore Bank of Canada, 3 per cent. dividend; the Merchants' Bank, 4 per cent.; the Mann Illinois Land Company, \$15 per share; the Dwight Manufacturing Company of Springfield, Massachusetts, 4 per cent.; and the Perkins Manufacturing Company of the same State, 2 per cent.

An important circumstance in connexion with the native supply of coal and iron in the United States—namely, the completion of the Chesapeake and Ohio Canal to the town of Cumberland, in Maryland—is mentioned as likely to take place in August next. The want of a coal possessing a fair proportion of bitumen has long been felt in America, and the deposits in the interior of Maryland, which, by the new canal, will be made accessible from the Atlantic seaboard, so that they may be shipped to New York or elsewhere, are of the semibituminous description, and extend over about 9000 acres. The country consists of a succession of hills and ravines, intersected by numerous navigable streams, and "cropping out" from the sides of these hills, and in successive layers, are beds of coal, iron ore, sandstone and limestone. The coal seams are from 2 to 17 feet in thickness, and both these and the iron can be reached by lateral cuts into the hillsides. It is contended that for locomotive purposes, and for the manufacture of iron, this coal blends in a most favourable proportion: the respective qualities of the anthracite and the fully bituminous. Hence, from the facilities of transit about to be given, a considerable impetus is anticipated for both these branches of enterprise, and it is said the demand for the steamers of the port of New York for the current year will exceed 100,000 tons. The Chesapeake and Ohio Canal was projected more than 60 years ago, and the plan originated with Washington. "The subject of internal improvements," it is remarked, "occupied his mind immediately after the close of the revolution, and in particular a navigable communication between the seaboard and the valley of the west. Nor did he fail to perceive the value of the coal region that would thus be approached. His first message to Congress—the first message to the first Congress—recommended the construction of a work of this kind to unite the waters of the Ohio with the seaboard."

CAUTION TO STEAM-ENGINE TENDERS.—On Saturday last, James Hughes, one of the engine tenders at the Shrubbery Ironworks, Wolverhampton, belonging to Messrs. Thornycroft and Co., was charged before the magistrates with neglect of duty on the previous Thursday morning, and allowing the water to get so low in the boiler as to render an explosion probable, had not a timely discovery took place. J. Chapman, an iron roller, deposed that, as he was going to work, he found the defendant so intoxicated that he could scarcely stand, and seemed quite stupid. He immediately examined the boilers, and found the float of one of them as low as it could go, when he immediately informed Mr. Colcomb, the manager, and the defect was remedied. He had had a brother scaled to death at Messrs. Vernon's works, which made him, whenever he found the engine-men off their guard, look to the boilers. Mr. Colcomb confirmed this evidence; and the defendant said it was the first time he had been found drunk at his duty, and it would be the last. The magistrate told him that, if any serious accident had happened, he would have been most severely punished. As it was, he should be committed to hard labour for a month; but if a similar case was brought before him, more severe punishment would follow the conviction.

MINING OPERATIONS IN RHONDDA VALLEY.—Last June, in travelling up the Rhondda Valley, a few colliers were observable on either side of the river, as far as Cymmer, whence the valleys of Rhondda Vawr and Rhondda Vach diverge; in the former, a mile or two westward of the confluence of both rivers, is situated the Dinas Colliery, known far and near by the peculiar superiority of its coking coal seam, which belongs principally to W. Coffin, Esq., of Llandaff, (the father of the coal trade in Glamorganshire). The abundant produce of this colliery was then brought down along an old tram road, and tipped into large waggons at Eirw Village, on the Rhondda branch of the Taff Vale Railway; but how altered the face of things has since become, instead of overhanging woods, impenetrable thickets, and impending precipices, a noble line of railway has been formed into either valley, and several new collieries are in active operation, daily using the same as a means of transit for their mineral treasures to port. So astonished was your correspondent at the agreeable metamorphosis, that he thinks it right not only to give the Taff Vale Railway Company credit for their spirit in opening so noble a field for the development of mining enterprise, but also the indefatigable individual who carried out their views in so incredibly short space of time, forming some miles of railway, through as difficult ground as any in the country, including six noble and substantially-built bridges, five of which span the river Rhondda, and the other is a handsome triple-arched bridge, spanning both lines of railway at the junction, and now forms part of the highway route to Aberdare, from Llantrisant. In 11 short months, with all the difficulties a contractor has to contend with in a hilly district, a wet autumn and winter season before him, to brave all as he has done, reflects very great credit upon him, and evidently shows that untiring energy has been displayed throughout, combined with no small share of skill and judgment. The individual deserving this commendation is Mr. Joseph Waters, of Caeleion, near Newport.—*Cambrian*.

NORTH STAFFORDSHIRE RAILWAY.—The principal event of the past week, in connection with the railway interest in Birmingham, has been the completion of the main line of the above undertaking. Great importance is very reasonably attached to the opening of this line, as it will establish a direct communication between the London and North-Western lines at Macclesfield, and to the Trent Valley.

PROGRESS OF CUTLERY MANUFACTURES.

English steel makers, it may not be generally known, give much higher prices for the Swedish Danemora (or Oregund) iron than for English iron, and the sales have been to such an extent as to give a monopoly to the sale of the produce of such mines to England: hence it has been worth the attention of Sheffield cutlers to perfect most elaborately articles manufactured from Danemora iron. The cause of the superiority of this iron over English, for the fine articles of cutlery, has never been explained; but whether it be the presence of manganese, or silica, or the nature of the process employed, first character razors can be made from no other iron. The patentees (C. Stewart and Co.) of the new razor—which invention we noticed on its introduction as a great improvement, the razor having a simple moveable guard adjusted to it with such precision and nicety, that a complete protection to the skin is secured, even if the razor were used in a railway carriage, and the beard is removed with the most perfect freedom and accuracy—have exhibited, at their establishment, at 22, Charing-cross, some specimens of this Swedish iron, and the razor forged from it. The specimens show the progressive stages of the manufacture of steel for the razor, from the iron in a crude state, or pig, to the rough or blistered steel, the latter in a refined state, the ingot broken to show the fineness of the grain in comparison with the blistered steel; refined steel drawn out in bars preparatory to being forged into razor blades, and the latter in their several states, of forging, hardening, grinding, and fitting on the guards, to the completely finished and highly polished razor. The simple arrangement of these specimens, each of which is described, is highly interesting, and gives a good general idea of the manipulation of iron and steel, and the various changes it undergoes in the course of manufacture.

The processes of tempering razors, penknives, and table knives are different. A temperature of 430° to 450° Fah. being required for razors; for penknives, 470° to 490° Fah.; while table knives require 510° to 550° Fah. The tempering of a razor is not less important than the grinding, since the fineness and durability of the edge depend greatly upon both. Each cutter uses such a heat, and tests it by such signs, as seem best to accord with the result of his own experience. Many razors are made of iron, without being converted into steel; and thousands are sold at a cheap price, made of English iron, which, if submitted to the test the Swedish iron can alone undergo, would fritter away in the subsequent processes, or become honey-combed and porous. Razors are often made from sponges to several guineas a pair, and it is, consequently, folly to attempt to persuade practical men that a shilling razor, which at the price can only be made from English bar-iron, from which the commonest character of hardware is manufactured—for instance, fire-irons, &c.—has the same fine enduring edge as the razor made from the Swedish iron converted into steel. It gives us pleasure to draw attention to the exquisite superiority and finish of Stewart's patent razors, which must ultimately restore this beautiful class of British manufactures; for, as we have before stated, they make all their razors from the Swedish Danemora iron, applying the best workmanship to its conversion into steel, and the tempering and finish when the razor is forged; and it is gratifying to think that the result shows that we were not wrong in our conclusion, that this patent razor, with its guard, would soon become an established favourite, and ultimately supersede the ordinary make of razors.

MINING IN CHILI.

The mining system of Chili is generally thus conducted:—There are two principal persons concerned in almost every mine, the *propietario* and the *habilitador*; the first is the actual miner, who lives at his hacienda, or farm, and attends to the details of working the ore. The *habilitador* resides at one or other of the sea-port towns; he is the mining capitalist, by whose means the miner is enabled to proceed with his work. The *habilitadores* are generally diligent and prudent men, the *propietario*, or miner, is too often improvident. The *propietario* farms his own ground, obtaining from his farm vegetables, and sometimes live stock, for the subsistence of his miners. The melting-house is also generally built on his hacienda, and the ore is brought to his door on the backs of mules. The farmer miners rarely work a mine with their own unassisted capital, they are seldom wealthy, and when they are so, it is found more advantageous to share with the *habilitador*, who takes charge of the financial part of the speculation. The miner is frequently without funds, and is at the mercy of the *habilitador*, who makes what terms he pleases. The mining laws in force in Chili are remnants of the Spanish mining code, with some slight modifications; every encouragement is given to search for mines. The discoverer may work a mine in any ground, by paying 6s. and before paying this he may try in the grounds of another man for 20 days. At the gold mines of Yauli the working miners are paid about 12 sterling a month, together with food. This food consists of 16 figs, and two small loaves of bread for breakfast, boiled beans for dinner, and broken roasted wheat grain for supper; they scarcely ever taste meat. The mine of Yauli is 450 ft. deep, and each man brings up nearly 2 cwt. of ore. With this load they have to climb up the alternate notches, cut in the trunks of trees, placed in a zig-zag line up the shaft. The men (who are quite naked, except drawers) ascend with this heavy load from the bottom. The miners are divided into two classes, those who break the ores, and the *apirres*, who are those that bring up the heavy burdens. According to general regulation, the *apirres* are not allowed to halt for breath, unless the mine is 600 ft. deep. The average load is considered as rather more than 200 lbs., and on occasions, loads of the weight of 300 lbs. have been brought to grass. Mr. Darwin, the geologist, of her Majesty's ship, *Beagle*, thus describes their condition:—"At the time the *apirres* were bringing up the usual load 12 times in one day—that is, 2400 lbs.—from 80 yards deep, and they were employed in the intervals in breaking and picking ore. These men, except from accidents, are healthy, appear cheerful; their bodies are not very muscular. They rarely eat meat once a week, and never oftener, and then only the hard dry *chaqui* (dried beef). Although with a knowledge that the labour is voluntary, it was nevertheless quite revolting to see the state in which they reached the mouth of the mine; their bodies bent forward, leaning with their arms on the steps, their legs bowed, the muscles quivering, the perspiration streaming from their faces over their breasts, their nostrils distended, the corners of their mouth forcibly drawn back, and the expulsion of their breath the most laborious; each time, from habit, they utter an articulate cry of "ay-ay," which ends in a sound rising deep from the chest, but shrill like the note of a fife. After staggering to the pile of ores, they emptied the "carpacho;" in two or three seconds, recovering their breath, they wiped the sweat from their brows, and apparently quite fresh, descended the mine again at a quick pace." The *apirres* live entirely on boiled beans and bread; they would prefer the bread alone, but the masters, finding they cannot work so hard on this, insist on their eating the beans also. Their pay is from 24s. to 28s. a month; they leave the mine only once in three weeks, when they stay with their families for two days. As a means of preventing the men from abstracting any of the gold or silver ore, the owners establish a very summary and stringent tribunal. Whenever the superintendent finds a lump of ore secreted for theft, its full value is stopped out of the wages of all the men, so that they may watch over each other, each having a direct interest in the honesty of all the rest. They undergo a great deal of labour, but being to a certain extent masters of their own actions, they bear up against what would wear down most men. Living for weeks together in most desolate spots, when they descend to the villages on fast days they run into all manner of extravagance. They occasionally gain a considerable sum, and then soon squander it. They drink excessively, buy quantities of clothes, and in a few days return to the mines without a rial. Previous to the arrival of the English mining companies, the Chilean miners were not aware of the value of yellow copper pyrites, and laughed at the English for entertaining such a notion, who soon undeceived them by making a profitable use of some veins of this ore, which they had bought for a mere trifle. Coquimbo is the centre of the copper mine trade, and Copiapo of the silver mines. It has been calculated that this latter port sent to Europe, by way of Valparaiso, from 1831 to 1841, 12,000,000 piastres worth of silver in bars, about 2,650,000 sterling. The mines of Coquimbo are in the Cordilleras, and in the hills towards the sea, and in the chains of mountains of the interior; the lodes are in quartz, with mica, hornblende, and felspar, in a gneiss formation; in some of the veins at Aristas, in the same vein, there is found native copper without a trace of silver, and native silver without a trace of copper; the ores of silver in general found are the native, muriate, and arseniate, and an amalgam of silver, cobalt, and antimony, which has generally been found embedded in sulphate of barytes.

EXPLOSIONS IN COAL MINES.—On Monday last, Lord Wharnccliffe, in the House of Lords, moved for a select committee to consider the best means of preventing the recurrence of accidents in coal mines. He believed there would be no opposition to the motion, and would, therefore, be brief in the few remarks he had to make. Considering the increase of knowledge since a committee of the House of Commons was appointed for the same purpose in 1835, and the still lamentable, and but too frequent recurrence of these awful catastrophes which have happened in the last two years, he believed every one would acknowledge that much advantage would follow a new inquiry. He did not think their sittings would be very protracted, but hoped they would be able to report on some efficient remedy for these deplorable accidents.—The Earl of CARLISLE did not apprehend any opposition, he was fully aware of the necessity of some remedial measure. Since the occurrence of the last accident the subject had not escaped the attention of the Government, and they had been considering the best means to be adopted. They had been in communication with Sir H. De la Beche, who was sanguine as to the success of a scheme proposed to him by Government.—The Earl of ST. GERMAN was glad the subject was brought forward by one so well acquainted with it as Lord Wharnccliffe. The motion was then agreed to.

The Eyam Mining Company (Sheffield) continue to meet with increasing encouragement, as the great level progresses towards its desired termination. On almost every hand of the level rich metal is met with, which will greatly liquidate the present and prospective cost of this great undertaking. When finished, experience, geological science, and human testimony, speak of a rich harvest for the spirited shareholders.—*Sheffield Times*.

IMPROVED RAILWAY WHEELS.

[Specification of patent granted to William Wharion, superintendent of the carriage department of the London and North-Western Railway Station, Euston-square, for certain improvements in the construction of vehicles to be used on railways, or other roads and ways. Inrolled, June, 1849.]

The patentee, in his specification of these improvements, thus sets forth the nature of his invention:—"The first part of my invention of certain improvements in the construction of vehicles used on railways, or on other roads or ways, consists in a new mode of constructing the wheels of such vehicles. The construction of the wheel is as follows:—Into the boss, or nave, the ends of curved wrought-iron spokes are cast, or, in some cases, it may be found desirable to form the nave of wrought-iron; the spokes are connected to a wooden felloe, and to the tire of the wheel, by countersunk bolts and nuts; and between each pair of spokes, wedge-shaped pieces of metal are placed, and which are connected together by a bolt, passed through a hole formed therein—the lower extremity of the said bolt having a thread cut about it; a corresponding thread, or screw, being formed in the hole in the wedge, into which the bolt takes; and by turning round the said bolt in one direction, by means of a key, or spanner, placed upon the head of the bolt, the wedge-shaped pieces will be made to approach towards each other, which will have the effect of compressing the curved sides of the spokes, and thereby cause that part of the spoke, which is in contact with the felloe, to be pressed forcibly against it; and such pressure will be transmitted from the felloe to the tire, and in this manner, and by these means, I form a solid and substantial wheel.

Another form of construction of wheel, to be applied to vehicles used on railways, consists in having the cast-iron boss, or nave, of the wheel formed in two parts, the tire being connected to the boss, or nave, in the following manner:—The boss, or nave, has holes formed therein, through which bolts are passed, in a radial direction, from the centre of the wheel, the said bolts being employed for the purpose hereinafter-mentioned, connected to the boss, or nave, of the wheel by countersunk bolts and nuts, passed through holes formed in the parts of the nave and block, the outer extremity of each of the blocks being securely connected to a ring of wrought-iron, formed with two flanges, by means of countersunk bolts, passed through holes formed in the tire, the ring, and block; and there is a hole formed through the centre of each block, and fitted with a short tube of metal, for the purpose of connecting these last-mentioned parts together by means of a split key, passed through a hole in the end of the bolt. Wedge-shaped pieces of metal are placed between each pair of wood blocks, and connected thereto, and to the boss, or nave, by a bolt and nut, or the bolt may be either cast into the nave of the wheel, in which case, there would be a nut upon its outer extremity; or the said bolt may be screwed into the nave of the wheel instead of passing through it, by turning round the bolt by means of a key, or spanner. The wedge-shaped piece will be forcibly pressed against and between each pair of blocks, and as each of these wedges is successively tightened, it will be obvious that each block will be compressed. The grain, or fibre, of the wood blocks must be placed radiating from the centre of the wheel, and in this manner, and by these means, I form a solid and substantial wheel. It could be observed, that the wedges may be easily tightened from time to time by the means before described, should the shrinkage of the wood blocks require it. Another form of construction of wheel is exhibited, which is only a modification of the wheel first described. In this case the wooden felloe is entirely dispensed with, the spokes being in close contact with the tire of the wheel, and connected thereto in a similar manner to the former wheel. Another part of my invention consists in constructing wheels upon the principle herebefore particularly described, with reference to wheels to be used on railways. The difference consists simply in making the tire of the wheel for common roads flat instead of flanged, and the nave must be formed to suit the axle upon which it is to be placed; in other respects, the arrangement and construction of the wheels are similar to those before described and represented.

Claims.—Firstly, the use and application of wedges, or wedge-shaped pieces of metal, in combination with, and adapted to, curved or bent spokes of metal, in the manner and for the purpose herebefore particularly described (with reference to *figs. 1, 2, 3, 8, 9, 10*, of the sheet of drawings annexed to the specification).—Secondly, I claim the application of wedges, or wedge-shaped pieces of metal, in combination with blocks of wood, either of the form shown or hexagonal, arranged in the manner, and for the purpose herebefore particularly described (with reference to *figs. 4, 5, 6, 7*, of the sheet of drawings annexed to the specification).

IMPROVEMENTS IN FURNACES AND OVENS—ANTHRACITE.

Mr. T. J. Knowlins, of Heysham Tower, near Lancaster, has secured a patent for a peculiar method of constructing and heating ovens and stoves, for warming and ventilating dwelling-houses, halls, churches, and all large public buildings, which, from the extraordinary effect produced by a very small proportion of fuel, we should expect will very soon force its way into public estimation. The ovens are constructed of sizes to suit a large family, from one sufficient to bake four or five joints, pastry, &c., at once, or a good size family batch of bread, to small ones sufficient for one dish or a couple of loaves. The usual mode of construction of furnace grates is completely reversed in this invention; in one of good dimensions fixed in the basement story of our offices, the bottom of the oven is raised from the kitchen-floor only sufficient to allow of an ash drawer, leaving a space $4\frac{1}{2}$ in. deep, and which space also forms a portion of the flue. The fire-place is an opening in the upper surface plate, without any grating, forming, as it were, a fire pan 17 in. long, 12 in. wide, and 10 in. deep, the cover of which is cast with semicircular indentations all round it, for the admission of air. The oven is formed of Stourbridge fire-brick, except the front plate and doors, which are, with the top, of cast-iron; and around it, over the top, along the sides, bottom, and back, is one continuous flue of 2 in., formed between two courses of fire-brick slabs, terminating eventually in the chimney. There are also the necessary dampers for regulating the heat. Having once lit a coal fire, and allowing the full play of all the powers of the draught, which, it will be understood, passes downwards through the fuel under combustion, and through slits, or openings, in the fire-built slabs at the sides into the flues, a heat can be obtained equal in intensity to a steam-engine furnace, anthracite coal burns with great facility, and can be kept in a state of complete incandescence; and once heated, the oven will keep for hours fit for cooking, with a small amount of fire truly astonishing. Anything in the shape of carbonaceous matter burns in this stove with great economy, the ashes and refuse of other grates, breeze, the sifting of the dust bin, and what, under other circumstances, would be thrown away may here be turned to economical advantage. We have also a smaller one fixed in the same apartment, both of which may be inspected by any persons who feel interested. The size of the larger oven is 2 ft. 9 in. long, 1 ft. 9 in. deep, and 1 ft. 6 in. high; of the smaller 14 in. long, 11 in. deep, and 9 in. high. Stoves for heating and ventilating buildings are constructed on the same principles, but the oven being absent gives room for other arrangements, by which a large amount of heating surface is exposed to the atmosphere, while the most elegant designs may be adopted in their construction. There is also a claim under Mr. Knowlins's patent, for a method of compressing atmospheric air by any suitable blowing or forcing apparatus, and causing it to pass through hollow fire-bars of iron, when anthracite coal is being consumed, by which means heated air is obtained, and, at the same time, the fire-bars are kept sufficiently cool to prevent their being destroyed by the great heat produced from that description of coal. When an extremely hot fire is desirable, the bars may have numerous small perforations on their upper surfaces, and the compressed air may be thus blown among the anthracite, thereby greatly facilitating combustion.

By a former patent, Mr. Knowlins has secured the right of application of pyrometers for kitchen ranges, which indicate the heat inside the oven by a clock face on the outside. [The construction of these pyrometers is very simple, and we expect to have one in a few days, which may also be seen at our office. Mr. Knowlins's system of combustion is also applicable to the roasting of ores and minerals, steam-engine boilers, and other purposes, where great heat is required.]

TRADING TO CALIFORNIA.—Among other articles going out to San Francisco by the *Jane Dixon*, which is to sail from Liverpool this week for California, there are a lot of patent portable forges, smith's hearths, and other materials connected with such matters. Some of the largest-sized forges are fitted with cupolas and close furnaces—the latter being lined with fire-clay; and they are made so as to fit over the hearth. The furnaces contain crucibles, in which gold, silver, and other metals can be melted—so that in fact one machine furnishes all that can be wanted in the "diggings."—*Liverpool Standard*.

Original Correspondence.

RAILWAYS AND FREE TRADE.

SIR.—There is but too much truth in the observation that every day's experience continues to exhibit the disastrous effects upon this country, arising from the excessive speculations in railways. It is also a most unfortunate coincidence, that while this country is depressed to the lowest pitch by the foolish speculations of 1845 and 1846, we are almost weekly informed of the buoyant resources of the United States, and of the eagerness with which they are seized, and not unfrequently to our great disadvantage. For instance, while we should have been, at the latest, three or four years ago introducing improvements of vital importance to the west of England, they have been wholly neglected. The consequences are now become but too apparent, in the establishment of three copper smelting-works in the States; and the last accounts from India announce that American copper was sold to the amount of 600 cwt., at the remunerative average price of 55 rupees per cwt., which, at the present rate of exchange, is 11d. per lb. The other day, also, intelligence reached this country that the Americans are determined not only to grow cotton, but to spin and weave it too, in the very States where it is grown. These, with other facts of a like nature, cannot but have a bad effect upon the trade of this country.

Again, the Board of Trade returns for the four months, ending with the 5th of last May, show how necessary it was to introduce improvements in the metallurgical operations connected with Cornwall. For here we find that the importations for the four months, ending 5th of May, of this year, compared with the same period of 1845, to be as follows:—

	1845.	1846.
Copper ore	16,105	15,111
Copper	335	139
Tin	102	82
Lead	1,145	387

Thus, in every item, there is a considerable increase. No wonder, then, that the tin trade has lately received a severe shock (the fall in price having been 14d. in four months), by the announcement of the sale of 250,000 slabs of Banca tin on the 2d August next, at Amsterdam. The fact that, notwithstanding the Custom house duty in the United Kingdom of 6l. 6s. per ton upon foreign tin, or 11s. per cent. on the present price (viz. 73l. per ton for English blocks), the foreigner thinks it worth his while to ship nearly twice as much tin to this country as he did in the same period of last year. And this very day, at Swansea, there will be a sale of not less than 1554 tons Barra Burra copper ore, being the largest quantity of the same ore ever offered for sale there.

The sales altogether at that place, for the quarter ending the 30th of this month, will, probably, be close upon the large sum of 206,000l., which will much exceed the value of the Cornish sales for the same time. There is also great reason to believe that before the effects of these importations of ore are well over, we shall most likely hear that considerable shipments of copper have actually been made of the copper ore smelted in South Australia; it being altogether a mistake to say that the Barra Burra ores are difficult of reduction by themselves; at all events, I found none, nor will there be, if they treat them *diametrically* opposite to the Cornish ores. Now, no reader of your Journal can deny that these effects have not been anticipated in the letters of your numerous correspondents, for even Mr. Pridaux reiterates in your last Number, that "my feeling was (as it is still) that a radical change in the smelting process is imminent." It had been well for the mining interest of Cornwall that they had taken the initiative some years since in improvements, which were self-evident, and more than all, imperative.

In the meantime, to counteract the inevitable results consequent upon free trade, the first, and that which will produce the greatest measure of relief, is a speedy and a great reduction in taxation; the second, the introduction of improvements in the arts and manufactures, so as to keep a-head of the continental nations and the Americans, and even of our own colonies. Perhaps, no better instance of the necessity of the former could be selected than the fact that, in the town of Port Adelaide, South Australia, whose existence is only about 12 years old, there are several soap and candle manufactories, in which it is possible, from the very low price of tallow there, no duty, and the ease with which soap is now manufactured, to make excellent soap at 13d. per lb.; while in this country the same would cost at least 4d. per lb. As regards the latter, we see every now and then the overwhelming importance of improvements in manufactures, in the fact that the iron trade of Scotland last year produced 580,000 tons of cast-iron, and 90,000 tons of malleable iron, and this year the consumption of cast for malleable iron is going on at the increasing rate of about 3000 tons per week; while in 1829, the produce was only 37,700 tons of cast, and not a ton of malleable iron. The Welsh and the Staffordshire ironmasters can best tell the effects of the above prodigious increase.

Much valuable time has been lost in the West; but I confess I am not without hope, when I recollect it was down West that one of the first *experts* of the railway mismanagement took place. It was the autumn of last year that an evasive answer of the ex-chairman of a railway, as far-famed as the "three W's," and in which he figured, having been met with—"Come, come, no shuffling about it." (*Vide* the local papers of the meeting.) And, truly, no one can be surprised at the unwillingness in Cornwall to embark money in any speculation just now for the benefit of the mines, when it is remembered that unfinished railways there and in Devon have swallowed up more than a couple of millions of pounds sterling, and whose liabilities are equal to a couple more, and whose receipts are only about 40,000l. in the half-year, and working expenses, if fairly stated, at or near 70 per cent.; but, in the mean time, great evil is accruing to important interests in the west of England.—WILLIAM BIRKMYRE: June 21.

RAILWAY PRODIGALITY—No. II.

SIR.—The railway system had no sooner extended to London, than it assumed a grandeur never even dreamt of in the days of its provincial simplicity. Architects were called on to assist the engineers in devising new means of expenditure, and costly stations became as absolute a necessity as locomotive engines. Being as well or better paid than her Majesty's Ministers, it was but fitting that the railway officials should transact their business in palaces, and that the secretary at the Euston, or any other terminus, should be as well housed as the secretary in Whitehall, or Downing-street. The shareholders were amazed at all this magnificence, but withal rather pleased with the notion of being part owners of such splendid public buildings, especially so long as a dividend of 8 or 10 per cent. awaited their acceptance. The country proprietors, however, looked on these metropolitan palaces with a jealous eye, and it became necessary to conciliate them, by eclipsing the beauty of their town-halls and gais in the erection of stations, displaying all the possible vagaries of architectural fancy. "Extension" is a word of great significance in the railway nomenclature, and is used both indefinitely and interminably. There are "extension accounts," "extension shares," "extension lines," "extension calls"—in fact, the whole system is an "extension" of something or other. The extension of this expenditure is, however, by far the most extensive of these "extensions," and having cursorily noticed the "comfortable" accommodation provided for the officers of the companies, it may be as well to revert to the early periods of railway history, and show how this principle of "extension" was first introduced.

In the first communication on this subject, an examination into the preliminary expenses was commenced, in which it was shown that, as the system expanded, much scrupulousness as to obtaining amended Acts of Parliament entirely vanished, and that such proceedings had ceased to be regarded otherwise than as clever and creditable. The removal of this wholesome restraint has had more important consequences than could have been anticipated, and has given rise to a mode of investing capital to an amount never contemplated by the most sanguine projector. The hundreds of thousands of pounds that have been unsparingly lavished in this way would have made many miles of railway, if the money had been legitimately expended. Nor is this the only evil; it has induced extravagance in every other department. The time was when an Act of Parliament could be obtained, including all preliminary expenses, for 3000l., or at most 5000l.; 10, 20, and 50 times this amount is now devoted to this object. Nor is the work so well done for the larger expenditure as it used to be for the smaller. We see solicitors' bills for 30,000l. and upwards, engineers 28,000l. and more, and so forth. Then come the amended Acts, not a whit less costly, and the Parliamentary contests between two companies, the most foolish and the most extravagant proceedings ever perpetrated. Were the committees of investigation to extract from the accounts all the items which constitute their charges, no comment would be necessary to direct attention to the prodigality of railways in this department. So long as these abuses are permitted to exist, it is in vain to hope for increased dividends from economical reforms. The wages of the la-

bourers, the salaries of the clerks, the cost of working the line, and the prices of materials, may all be reduced to the lowest amount, without making an appreciable difference to the shareholder. The preliminary expenses are nominally confined to the period antecedent to the first Act constituting the company being obtained, but they are not so in reality. Like the "capital accounts" of most companies, they are subject to the constant operation of the principle of "extension," and few, if any of them, have ceased annually absorbing large sums of money, most of which might be saved for better purposes.

Much has been said lately about working the lines by contract, and it is well worth considering whether this plan could not be very advantageously pursued in the departments requiring professional services. Such a system has been tried in the engineering department, satisfactorily to the parties engaged, and very beneficially to the company. The contracts could be so framed, as to insure all possible accuracy and completeness, and to protect the company from the consequence of errors. But it may be said that such a plan would not be accepted by engineers of eminence, and that in consequence their services would be lost to the public. In some instances such might possibly be the case, but there is no dearth of talent, skill, and experience, in the less successful members of the profession, which would amply compensate the public for the loss thus sustained. Besides, it is notorious that distinguished engineers have already undertaken such contracts, and even were such not the case, if employment could not be obtained on other terms, there is little doubt but that such would be accepted to.

Such a reform would, however, be very incomplete, unless it embraced the legal profession also, even though there may be greater difficulties to encounter in carrying it out. As regards solicitors, the object may possibly be best effected by paying them salaries instead of fees, and in no instance whatever allowing any extra charges. Under such an arrangement the interests of the company and its solicitor would be identified, inasmuch as both would be most promoted by every possible care being taken to avoid all such law and Parliamentary proceedings as were not absolutely essential to the well-being of the company. With barristers such an arrangement, it is feared, would be impossible, owing to the established customs of the bar, but the enormous expenditure which is now incurred might be very considerably reduced by not employing more than two counsel on each bill, and instituting a more moderate and reasonable scale of fees than what at present prevails.

That such reforms are really needed, and are practicable, there cannot be the shadow of a doubt, and if honestly and determinedly carried into effect, it is equally certain that they would most essentially promote the prosperity, by very materially diminishing the prodigality, of railways. June 18. F. G. S.

RAILWAYS AND MINES.

SIR.—I have read, with considerable interest, the correspondence between two of your contributors on the above subject; at the same time, if the articles have been interesting, I cannot conceive that the system of running down any kind of property, already too much depressed, can advantage either party.

Now, Mr. Editor, I am personally interested in the success of mines; at the same time, I will be bold enough to state that I am, for the most part, dependent upon railways for my income, having never yet been fortunate enough to obtain any dividends from my mining shares, although having disposed, at times, of some of the latter at a premium, I may, perhaps, consider myself so far fortunate in embracing that opportunity. Your correspondent, "Placer," appears to entertain a great antipathy against the railway interest, which has carried him beyond the bounds of prudent calculation; for, otherwise, what sensible man would have taken one week's traffic to prove that the deficiency in the receipts upon the lines enumerated by him in his letter, No. 4, would amount to about 400,000l. per annum, compared with those of a former year, with a mileage of 162 less opened? A very slight attention to the told sums already received by these companies, would have demonstrated the fallacy of this calculation, and the great increase that has taken place in the traffic upon nearly all railways since his letter has appeared in print must, or ought to, convince the writer of the folly of such a statement. That many railways have suffered from bad management is perfectly correct; that many mines have suffered from the same cause is a fact too well known in mining districts to be disputed; at the same time, a "foreigner" must be sharper than a Yorkshireman if he discovers anything wrong, be his questions directed either to captains, or miners, or even (as has sometimes been the case) to the clergyman of the parish where the mine may be. But enough; as a friend to those western counties, whose principal support is derived from money advanced by adventurers in the mining speculation, I do not wish to bring on the carpet the doings, or rather misdoings, of those who get up mines merely for the sake of personal profit, and selling of shares, or the culpable waste of capital, even in those mines which, but for such extravagance, might make some return to the adventurers. I would just notice that "Placer" has inadvertently fallen into an error as to the comparative traffic of the Great Western for the week of this and that of last year. Since last year the Great Western traffic amount included that of the Bristol and Exeter; this is not allowed for by him. This omission will of itself very greatly affect his clever calculations, as the probable traffic of the Bristol and Exeter, for the corresponding week of last year, was 4000l. I shall conclude, by expressing a hope that the above observations may have the effect of moderating the severity of "Placer's" future attacks upon railway property, and that he may become acquainted with the old adage, that "those who live in glass houses should beware how they throw stones."—VERBUM SAT: Devon, June 14.

[In inserting the communications of our correspondents, "Placer" and "Engineer," we can have no wish to run down any one interest with the view of advancing another, our sole object being the eliciting opinions and facts which may lead to a true view of the subject under discussion; while we candidly confess we think the above gentle expostulation worthy of "Placer's" consideration.]

PREVENTION OF DRY-ROT—SIR WILLIAM BURNETT'S PATENT.

SIR.—Observing in your valuable Journal of the 16th inst., in the column, "Notices to Correspondents," a recommendation to "F. A." (Deptford) to use chloride of zinc as a good solution to prevent dry-rot, I beg to inform you that the use of the solution in question for the preservation of timber, canvas, &c., is patented by Sir W. Burnett; and I beg that you will caution your correspondent, and the public generally, against the use of any chloride of zinc, but such as may be obtained at the office of the proprietors of the patent, 53, King William-street, London-bridge, who will give the necessary instructions with it. C. JACKSON, Secretary. London, June 21.

ON THE NATURE AND PROPERTIES OF SLATE ROCKS.

SIR.—In your Journal of the 9th inst. there is a letter under this head, by Mr. Radley, Ch. E., Grown Slate Office. When I first saw it I was in hopes of finding, if not something new, at all events a clear intelligible description of the slate rocks, and a practical illustration of their structure—a subject little understood by theoretical geologists. I was much disappointed. Why does he introduce the French term "gisement"? The writer complains that this subject "has been as much beset by anomalies of opinion, expressed in as many varieties of phrase as that of any other moot point of physical geography," &c.; and yet he commits the same faults himself to a greater degree, without giving the least idea of the ordinary character of the rocks he proposes to describe. It is very true that there are many absurdities in the geological works, and that our common-sense men, who study such subjects from nature, pay no regard whatever to the sayings of those geological instructors, but close such books immediately, when they find therein the igneous origin of this and that rock, and similar dogmas; but, it is equally offensive to scientific practical men to mystify the subject by the introduction of questionable and unnecessary terms. Mr. Radley speaks of "the difference between the true volcanic and primitive tellurian rocks, in the unmistakably igneous character of basalt, and polymorphic condition of the granitic series," &c., as if the whole of the rocks called basalt had been exposed to melting heat, which is a very great mistake. The writer then concludes, by asserting the identity, or the similarity, of the "gisement" composition, and physical qualities and chemical relations of the carboniferous shales with the slates and grauwacke of the trap-rock series, and leaves us completely in the dark on the main question. If Mr. Radley will favour us with an explanatory letter, perhaps he will give the meaning of the formation he calls the "slate of the trap-rock series." A MINE AND QUARRY AGENT. Wicklow, June 18.

[It may be right to remark here, that we have been informed Mr. Radley transmitted a second communication on the subject through the post, which, by some mischance, has never reached us.]

COPPER SHEATHING.

SIR.—In your Journal of last week, I find there is a communication from your intelligent correspondent, Mr. Pridaux, on the subject of copper sheathing. I, for one, would contribute my mite to the elucidation of this subject, if I could possibly find out what was wanted. I always considered that the desideratum for the sheathing of ships was a metal that would oxidise in sea water sufficiently to prevent the accumulation of barnacles, yet not so much as to cause a too expensive wear and tear.

I was under the idea that Muntz's yellow metal combined these advantages, together with the important one of cheapness. I should be glad to hear from any of your correspondents wherein this alloy does not answer the purpose required. I scarcely agree with Mr. Pridaux, when he accounts it of secondary importance that smelters should produce pure copper. I am of opinion, for the general purposes of manufacture, that the more pure the copper, the better it is; and that should any alloy be required, it is preferable to add it when wanted. Smelters had better not attempt to "swell the surplus," by leaving impurity in the copper; but rather to gain their profits by economical modes of refining.

Mr. Pridaux remarked, in a communication to your Journal, some months since, that in making blow-pipe trials of an alloy of manganese, iron, cobalt, nickel, and copper, he found them partially to agree with my statements in yours of the 4th of November, 1845; but as Mr. Pridaux did not clearly mention in what he found his trials to disagree with my assertions, I could not possibly answer him. A. MERRY. Birmingham, June 20.

CALIFORNIAN GOLD DEPOSITS—QUICKSILVER.

SIR.—The most interesting subject of the day relative to mining is unquestionably the Californian gold deposits; and various as opinions are on the probable results of their discovery, no doubt exists that immense amounts of gold will be produced. Then comes the question, will our standard be affected? It is, in the first place, necessary to know what amount of gold, added in a given number of years to the existing circulation of the world, would lower its value, and then to calculate the probability of California furnishing that quantity.

I will assume that 300,000,000l. sterling, raised in four years, would have this effect. Is it likely that California will produce this amount in that time?—I think it is. The discovery of gold in Minas Geraes, Brazil, by the Paulistas, about 130 years since, had the effect in a few years of lowering the price of gold. During that time, and for a considerable period after, no lodes were worked by them. The precious metal was obtained from the gravel on the sides of rivers, from the sand of rivers, from their beds, by diverting the stream into new channels, and from the bottoms of brooks.

The gold deposit in California appears, by all accounts, to be of a precisely similar nature to that of Brazil, but the face of the country differs materially. The Minas Geraes gold district is throughout composed of hills, and occasional ranges of mountains; California, from the sea-shore to the foot of the Sierra Nevada, is level, or slightly undulating; through it flow numerous small streams (all bearing gold in their sands), whose channels can be changed with comparative facility. When the Paulistas settled in Minas Geraes, the colonists in Brazil lived under the most despotic law; no foreigner was permitted to go into the interior, or foreign flag to enter the ports; the colonists were prohibited from consuming any but Portuguese goods; they paid one-fifth of the gold extracted to the Crown; and, if notwithstanding this bleeding, they waxed too wealthy, were completely at the mercy of a viceroy and his subordinates. It is wonderful that under such a system Minas Geraes returned so much gold as to affect its value, for the province when most prosperous, about the year 1770, did not contain so many inhabitants as have at this moment landed on the shores of California.

When I compare the nature of the gold-bearing country in Brazil with California—the sloth of the Portuguese colonist with the untiring industry and perseverance of the Anglo-American—the isolation of trade fettered, and despot-ruled Minas Geraes, with the open ports and free institutions of the United States, I cannot but believe that California will do more in four years than Minas Geraes did in forty; the former will have more than tenfold the number of, and better, men, and that in a country where Nature has made the work easier. A large proportion of the gold raised in California will find its way to the western states of South America, the United States, India, China, and New South Wales, but eventually the golden streams will meet in London. Admitting that the impulse given to commerce in general by the increase of gold will bring with it an increased demand for coin, it must be remembered that England is the only country in which gold is the standard of value, and that the silver mines are certain to very largely increase their returns, owing to the lower and still falling value of quicksilver, which will admit the working of mines now of no value, and have an immediate effect, by enabling mine proprietors to send to the patio millions of tons of ore now on the surface, of a ley too low to pay for dressing and amalgamation, when the price of quicksilver was so high as it has ruled at for some years.

Some 20 years since, quicksilver was, I believe, about 2s. per lb. The closing of the Austrian mines at Idria, caused by the water overpowering the machinery, gave Spain the monopoly of the article. Always in want of money, the Government of that country sold the returns of the Almaden Mines for a term of years, to contractors who could advance cash; the contractors rose the price up to 4s. per lb. (I believe this is within the mark), making fortunes themselves, but closing hundreds of silver mines. The price has already fallen; one cinnabar lode is fairly at work in the real El Dorado, under the management of its enterprising owner. Other similar formations have been discovered; and it is reasonable to expect that California will shortly supply her neighbours with any quantity of quicksilver, and at prices which the deep mines of Almaden will be unable to compete with; the same, and earlier, will be the fate of all gold mines whose heavy expenditure, increasing constantly with the depth, will bring them to ruin when gold of 22 carats is no longer worth, per oz., the magic figures 3l. 17s. 9d.—C.: London, June 21.

CHILI AND CENTRAL AMERICA MINES.

SIR.—In your abstract of *Wild Life in the Interior of Central America*, I find the following observation, which, if not corrected, will lead to erroneous conclusions, and especially amongst geological compilers:—"Another distinction is, that while in Chili every great copper vein takes its direction north and south, and the gold and silver mines generally run from east to west, in Central America the reverse is to be observed in each instance." The author, who appears to be better acquainted with the indolence and political state of these countries, than their mineralogical character, must have been misled by the natives. The silver veins of Copiapo, in Chili, run north and south, and they are often accompanied with thin veins of copper. The most productive copper veins run east and west; and the auriferous pyrites run in the same direction in the porphyritic rocks of the Cordillera. The copper of Central America is principally found in its metallic state, disseminated, and in flakes, within the cleavage and joints of the slaty rocks. Copper ores, or veins, are very scarce in this part of America. The gold veins of Central America are principally auriferous quartz, running, as they generally do, north and south, as in Virginia and other places; and also the argentiferous lead veins, therefore, in conformity to the usual geological order of metalliferous districts.—EVAN HOPKINS: London, June 20.

GOVERNMENT INSPECTION OF MINES.

SIR.—I have observed with surprise your commendation of the bill lately introduced into the House of Commons for the better regulation of coal mines, which you describe as "well adapted for the evils it is intended to cure," and apprehend that the opinion of most practical men will not be in unison with yours on this point. In its present shape this bill is full of objectionable matter, and, if carried into operation without many and great alterations, must inevitably prove the prolific source of constant annoyance and needless expense, without securing the objects contemplated. The "care and forethought" expended in its compilation, which you have alluded to, have evidently not resulted from a practical acquaintance with the important subject treated upon, and without a thorough infusion of this most vital element in the composition of such an Act, all attempts to accomplish the purpose aimed at will be fruitless. I will here just briefly refer to a few of the most objectionable and impracticable clauses, and earnestly advise all interested in this matter to obtain, without delay, a copy of the proposed bill, and seriously to consider the evil results which must inevitably follow from the carrying out of this absurd and impolitic Act. Clause 9 enacts, that when any person receives an injury, by which he is disabled from going to work next morning, notice thereof is to be given to an inspector, who will examine into every such case with the aid of a

surgeon, and report thereon, within 24 hours, to London. Now, it is well known that in all extensive mining establishments slight injuries, such as keep men from their work a day or two, are occurring daily from the most trivial causes, yet such are to be magnified into fitting subjects for surgeons' visitations, inspectors' reports, and national interference! Neither can clause 21 be carried into effect, which provides that the wages of colliers are to be paid by the actual weight of the coal brought to surface, and not by measurement, as in many instances the greater portion of the coal hewed by the collier is never brought to surface, but left underground, as refuse or valueless. Nor would it prove to the interest of either employer or employed to have a weekly payment, as contemplated by clause 22, as such an arrangement would necessarily involve upon the one a considerable increase of office labour and expense; and afford to the other increased temptations to idleness and excess. It is also proposed to make it obligatory to pay each workman separately, which, in many instances, would be attended with great inconvenience and delay; and if the object aimed at by this be to obviate the acknowledged evils of the truck system, far better would it be to put in force the already existing stringent Acts on this subject, than to encumber the present proposed Act with matters of such comparatively minor importance. The proposed plan for levying the income requisite for the working of the machinery of this Act, will be thought by many inquisitorial and unfairly burdensome, especially on large concerns. The clause for making the agents responsible, under certain circumstances, for the consequence of accidents is, I contend, in a monetary point of view, neither practicable nor just, taking into consideration their usually limited means, and the proportionate interest they have in their employers' concerns. I would not wish it to be inferred from these remarks, that I am wholly opposed to a judicious system of inspection in our coal mines, as I have reason to believe that much good might be effected, in many instances, from the adoption of such a course; but I do conceive that the powers given to inspectors, under any Act, ought at first to be more suggestive than compulsory, except in extreme cases, and their efforts should be mainly directed to promote the adoption generally of sound principles of ventilating and working, rather than a petty interference with details which belong more properly to, and will generally be carried out more satisfactorily by, the regular staff of each separate establishment.—*THE BLACK DIAMOND: Kilburn, June 19.*

INVENTIONS FOR THE PREVENTION OF ACCIDENTS IN MINES.

Sir,—All who are interested in the safety of the miner are under great obligations to you—not only for your able and persevering advocacy of their cause, but also for the early and authentic information communicated in your columns, relating to such inventions as are designed to diminish the great loss of life which now occurs, with such painful frequency, in the collieries of the United Kingdom. In addition to the improved systems of ventilation, as proposed by Mr. Gurney, Mr. Struvé, and others, and various new modifications of the safety-lamp, full descriptions of which have recently appeared in your Journal, your paper of last Saturday contains an interesting document, bearing unexceptionable testimony as to the complete success of Mr. Fourdrinier's apparatus for preventing the fatal consequences of the breakage of ropes, or chains, in shafts. The great number of dreadful accidents which are constantly happening from this cause, renders the announcement of the satisfactory working of the apparatus at Usworth for two months most important, inasmuch as it proves that the inventor has triumphed over the difficulties which it was understood partially impeded its complete operation. Mr. Fourdrinier is entitled to great credit for the ingenuity, mechanical skill, and perseverance which he has displayed; and it is to be hoped that he will be well repaid for the time and talent he has devoted to perfect his invention, by its being universally adopted in all pits. But are there any reasonable grounds for believing that such will be the case? Experience teaches otherwise. During the present year, two hundred and seventy-one persons have been killed, and 105 seriously injured in the mines of Great Britain. Of these, 149 were killed, and 58 wounded by explosions; 41 met dreadful deaths, and 18 were terribly injured in the shafts; 71 were crushed to death, and 27 were seriously maimed by falls from the roof; whilst 10 were killed, and two were injured, by other accidents; these are abstracted from your weekly obituary of accidents, which is far short of the whole amount of human life thus sacrificed.

Years have elapsed since Mr. Gurney promulgated the scheme of improving the ventilation of mines by the use of high-pressure steam; yet there is only one instance on record of its having been adopted since 1835, although information respecting it has been widely diffused, and proof has been given of its efficacy. The success of Mr. Struvé's patent ventilator has also been unequivocally evidenced in one instance, but has not been applied in others.

It thus appears that a great loss of life is daily occurring in our mines, whilst known means of prevention are not resorted to. The same neglect of providing means of comparative safety as regards the ventilation, will most probably be shown towards the safety of the men whilst ascending or descending the shafts, unless some legislative measures be speedily taken to enforce the adoption of the most effectual means for the prevention of these dreadful accidents.—*J. RICHARDSON, C.E. Neath, June 19.*

[We are of our correspondent's opinion; it is of little use perfecting machinery for the safety of life unless accompanied with legislative enactments, to compel their use. Fourdrinier's apparatus is the first that has proved effectual for preventing injury by ropes breaking; but past experience teaches us it will be in but little demand, unless a clause is inserted in the Act for the regulation of collieries for its universal adoption, or one or two verdicts of "Manslaughter" are returned against coalowners, for allowing men to be killed, when they might prevent it.]

GOVERNMENT INSPECTORS OF COLLIERIES, VENTILATION &c.

Sir,—There can be no question as to the imperative necessity of insisting that every colliery should be properly ventilated, so as to ensure at all times the safety of the individuals who are engaged in them, so far as this can be done by a judicious system of working. However, accidents will occur sometimes in these seams and recesses of inflammable gases, in spite of all the precautions made, in consequence of the vast quantities of coal, and the great number of persons confined to such limited areas in England, as compared to other countries. In framing legislative enactments for the better regulation of coal mines, the number of colliers to be employed at one time on a given area should be considered, as well as the system of ventilation, suitable to the geological nature of any given coal beds. With regard to weekly payments, &c., such questions are as irrelevant as impracticable, from the very nature of the work carried on; it would lead to loss of time and irregularities, and, doubtless, create such an opposition as would defeat the object in view. I do not think it possible, under existing circumstances, and the very dense masses of individuals employed in breaking coal, to introduce anything at present more than preparatory and suggestive measures, and the establishing of an office for mining records, &c., which in time may tend to check the want of care, and ultimately be the means of introducing a more uniform and stringent system in our mining industry. The new Act should be strictly confined to its legitimate object, and not be mixed up with the truck system measures, and other petty questions which cannot be enforced.

In my former communications I have insisted repeatedly that, however good the ventilating current may be, collieries having undulating roofs and cavities above the seams will always be in danger, owing to the accumulation of the gas in the upper recesses, unless the gas is drawn out by means of small pipes, expressly employed for that purpose. The gas floats in these places like bubbles of air in undulating water-pipes.

Those who pretend that they can clear such "goaves" by means of the ordinary current should not be trusted, as it would inevitably lead to danger. In your last week's Journal we have an account of an explosion originating from the above cause.

Hebburn Colliery.—The viewers maintained that "the air was always good, and that the men worked with naked candles"; but there was much undulation in the roof, where it was thought the gas lodged. An increased rush of air would have the effect of carrying with it the expanded bubbles of the floating gas from the undulations to the spot where the men were at work, and cause the explosion. They bore testimony to the great care that was taken to secure ventilation in this colliery, and the general efficiency of the system; but they thought that the gas tended to accumulate in large quantities in the undulating roof. Yet the jury only recommended that the mine should be examined, and to see that the ventilation was always in proper order. What is to prevent the above accumulations, and explosions from the same cause?

These floating bubbles of gas are liable to expand into large volumes, and get within reach of the ventilating current, when the atmosphere becomes suddenly depressed—therefore, if such cavities are not kept constantly cleared by means of small gas pipes, catastrophes cannot be prevented.

The viewers of the respective manors, who in England occupy to a certain extent similar posts as the continental inspectors, ought to attend to these vital questions, for the sake of humanity as well as the property, and to point out beforehand that coal formations of certain geological character require a corresponding provision, to take away the consequent local accumulation of the gas.—*EVAN HOPKINS: London, June 18.*

SLATE ROCKS—GOLD DEPOSITS, &c.

Sir,—I have always considered your valuable Journal as the medium of diffusing useful practical knowledge, and that your contributors write with that object in view, and that when they undertake to write on any subject it is supposed that they have some practical knowledge of it. I regret that this does not appear to be the case with some of your late contributors. Their object seems to be to write long and apparent learned papers, to create an idea amongst some people of their great erudition. Mr. Radley's, "On Slate Works," is quite unintelligible to practical men, and this is evident from the want of practical knowledge of these rocks. Again, there are papers on "Gold Formations," by Mr. Birkmyre, which, as historic sketches, may possibly be interesting to the multitude, but not to miners. Besides, some parts appear to have been extracted from old books, which are not correct in the details, both as regards the deposits as well as the process. I should like to know, where did Mr. B. see "Gold in magnesian limestone."—*T. R.: Penzance, June 20.*

CRADDOCK'S IMPROVEMENTS IN THE STEAM-ENGINE.

Sir,—From the great noise made in the world respecting the means of rendering mankind comfortable, healthful, and improving, one is led to suppose that such desire really exists to a great extent, and that the labours of any who devote their energies in a successful manner to the realisation of such objects, would find encouragement and support; but, unhappily, the history of the past, and the experience of the present, show that those who labour most successfully in the realisation of any extensive and permanent good, are sure to receive, as their reward, persecution and misrepresentation from the interested and envious, and from the public at large apathy, distrust, and neglect.

Had Watt been empowered to have rolled back the ocean, so as to have doubled the acreage of Great Britain, he would not have conferred so great a boon upon his country as he did by his labours in improving the steam-engine. Yet this man for eight years treated in the most cruel manner by the then engineers, whose opinion, of course, the public consulted as to the utility and value of his invention; and the engineers then, as now, of course condemned it as too complex, and as certain not to answer. The public, too, ever ungrateful to its real benefactors, left the inventor then, as now, to the cruel persecution of his unmerciful enemies, until lastingly discouraged, and misanthropic, accompanied—or rather produced—by a derangement of the nervous system, at one time threatened his life.

Will it never be perceived that the interest of the public and that of these engineers are opposed to each other? does the public require to be told at this time of day that establishments, such as those of our landing cranes, have been arranged at great expense to construct engines of the common class, and that, consequently, on this ground they dread, and will to the uttermost of their power obstruct, any innovation that materially changes the structure of the engine required by the public. The question with them is not what the public may gain by any invention, but what they themselves may lose. He knows little of the workshop who is not aware of the immense advantages possessed by those who have properly adapted machinery, and a thorough and well-arranged system, for the construction of engines of a given class and structure, as upon this mainly depends the success of such a business, but also the pleasure and ease with which it can be conducted. Therefore, on this account alone, unless we suppose engineers exempt from a regard to their own interests, which warps the judgment and determines the opinions of other men, we must expect that their opinion would be adverse to all improvements, and that so in the exact ratio of such improvements. Is a good and comprehensive invention—one which has required immense thought, labour, and expense for its realisation—one which really contains in its principles of great practical and public value—only a trifling improvement, or a bubble scheme, they know they have nothing to fear; and they feel, it may be, pleasure in seeing capitalists take them up, knowing that the loss thus incurred will aid them in suppressing any good thing which their interests assure them they must suppress. The successful and wily persecutor is ever on the alert, and is judicious in his adaptations of means suited to accomplish his ends. Intellect, which the class of men I am now speaking of certainly possess, is as successful in accomplishing unworthy ends, as she is in her benign her beneficent aims over the material elements of the world. The selfishness which is the basis of the engineering profession participates more than does any other, and the envy engendered in its members when any but themselves participate in the merit of originating any extensive and good invention, are no small difficulties to oppose. Wherever this spirit is, it first strives to prevent the value of the invention being acknowledged and appreciated—it next endeavours to detect some imperfection in its author. The next stratagem for gratifying this most malignant of human passions is in some sophisticated manner to raise doubts as to the originality of the inventor, or to show that he is not entitled to the credit of the invention, or to show that his hard-earned reward, if he is to receive it, is not his own, but that it is due to some other person. These men seldom put the question to themselves—did, or did not, they originate it; if so, they would discover that they were but in the same position, whoever originated it.

Now, it is notorious, and theoretically acknowledged by all, that no advantages which can be derived from adventitious circumstances can compensate for a deficiency of natural aptitude; and where has this fact been more exemplified than in the engineering world? Is it not notorious that all great and good inventions have been made by men who were not engineers, or who were not engineers? Here then, again, the interests of engineers and of the public are not coincident. It is the interest of the public that natural aptitude in all the higher branches of its application should find encouragement and support; but he must be possessed of very erroneous notions who supposes that engineers will ever allow such encouragement if they can possibly help it, unless such aptitude be found in the higher branches of their own profession.

Metaphors that had the public only consulted those who are most benefited by monopoly, as to the recommendations of free trade, it would have been a long while before they (the monopolists) would have recommended the abolition of restrictive Acts of Parliament. The combined bias arising from envy and interest, which influences the engineer in reference to any comprehensive and original improvement, is much stronger, direct and personal, in determining his opinions or recommendations, than could possibly be those of monopolists in reference to Acts of Parliament.

Seen being the case, it can be easily understood how difficult and discouraging are the obstructions inventors have to contend against, when they are remembered that they commonly set out with a minority of only one in favour of their inventions. The clear reasoning of Adam Smith, in reference to free trade, has been many years diffusing itself, so as to form public opinion; and after all it required the mighty power of the League to educate and to stir up the public mind before the public would adopt it. Can it then be an easy matter for one individual to contend against such powerful obstructions?—surely not.

I have asserted that the value of the invention I have many times brought before the public is equal to a saving of 30,000,000, annually. I know its intrinsic worth, in every way, will soon give it the greatest and greatest success; but I am told by those I appeal to support that they consult engineers, and they (the engineers) are unanimous in the opinion they give, that my invention is good for nothing—at least, in this country. One is almost tempted to ask, if not in this country, where is the country they almost imply it would be of some value in? But I pass on to ask these men if they know really what the invention is? I tell them I know they do not; I know there is not one of them who has investigated it. But why not, I cannot tell; I have often invited them to do so. The only reason I can give, is their having determined to condemn it. It may seem agreeable to their conscience to do so in ignorance, and from which I fear I shall be able to escape; but before proceeding further, I feel that some apology is due from me to you, and your readers, for my introducing what follows. The only apology I have to offer is, that if the invention is worth anything, it is worth all I represent it to be; if so I may deserve support; but my only means of knowing for certain whether I can obtain it or not, is by simply and truly making my position known. With you, Mr. Editor, who has ever shown a desire to aid inventors, I feel assured this apology will be accepted.

About nine months ago a misunderstanding arose between my then two partners, the consequence was, that they were about to dispossess me of the property by a forced sale; I saw then, as I do now, that such a course was to throw away the thing just when it was matured, and beginning to come into use. I, therefore, offered to take to the whole concern upon the following terms, which they accepted, and which terms were, that I paid 2000*l.* in six months. This I accomplished by the aid of friends; but now I find I have to pay *£*2000 back to them before I can realise it from the engines, which were ready made when I took to the whole concern. With such difficulties I find it needless to struggle, unless I can find some way to get rid of the property, and from which I feel I shall be able to escape; but before proceeding further, I feel that some apology is due from me to you, and your readers, for my introducing what follows. The only apology I have to offer is, that if the invention is worth anything, it is worth all I represent it to be; if so I may deserve support; but my only means of knowing for certain whether I can obtain it or not, is by simply and truly making my position known. With you, Mr. Editor, who has ever shown a desire to aid inventors, I feel assured this apology will be accepted.

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Birmingham, June 19. *THOMAS CRADDOCK.*

CONSTANT GALVANIC BATTERY.—In our description, in last week's Journal, of Mr. Hjorth's large electro-magnetic engine, we stated that he was in treaty with a party who had discovered a new mode of constructing a battery, by which a constant power can be secured for an indefinite period. We have since had an opportunity of seeing the battery, at Mr. Pigott's, New Oxford-street, though without being allowed to inspect its internal arrangements—the patentee not having yet applied. It is fastened in a case under seal, to satisfy Mr. Hjorth and his friends that no renewals of its elements are required. There is the horse-shoe magnet, not very extensively covered with coils of wire, exhibiting very considerable power in attracting a tablet of iron; and we were informed that the inventor has had two and a half years' experience of its unvaried constancy of power. No very long period will elapse before the specification must be inrolled, when we shall give a correct description in our columns of this great desideratum for establishing this power economically.

THE BRITANNIA BRIDGE.

The greatest lion of the week has been the launch of the gigantic engineering structure, the tubes for the Britannia-bridge, to connect the Welsh coast with the Isle of Anglesea, for the transit of the trains on the Chester and Holyhead Railway, to and from Holyhead. The particular spot at which the Britannia-bridge crosses the Menai Straits is exactly a mile nearer to Carnarvon than the suspension bridge, the railway after leaving the end passing close under the Anglesea column. The stream is wider at this spot than at the suspension bridge, being about 1100 feet across at high water. It is divided nearly in the centre by the Britannia rock, which is naked at low water, but at high water is covered to a depth of 10 feet. This rock and the Anglesea shore consist of chlorite schist, a hard and intractable rock, exceedingly difficult to work, and as only a few hours each day could be spent on the rock, it took many months in laying the basement portion of the tower. The stone used is a hard carbonate of lime, called Anglesea marble, abounding in fossils, and which takes a high polish. Some of the stones in the work are 20 feet long, and weigh from 12 to 14 tons each; the interior masonry is the red sandstone, from Runcorn, in Cheshire; the stones in the towers are all left with a rough or quarry face, except at the angles, recesses, and the entablature, which gives the tower a noble appearance. The approaches are ornamented with lions in a *conchoidal* posture, 12 feet high, 25 long, and weighing 20 tons each. The side towers stand on the opposite shores, each at a distance of 460 feet from the centre tower; the abutments are situated inland, at a distance of 230 feet from the side towers. The Britannia tower is 62 feet by 52 feet 5 inches at the base. It tapers gently, so that where the tubes rest upon it, it is 55 feet by 45 feet 5 inches. Its total height is 230 feet; it contains 148,625 cubic feet of limestone, and 144,625 of sandstone, weighing nearly 200,000 tons, and there are 387 tons of cast iron built into it in beams and girders. The length of one of the large tubes is 472 feet, or, if stood on end, would reach 107 feet above the top of the cross of St. Pauls. The entire length of the bridge, including the shore works is 1849 feet, corresponding with the present *Anno Domini*; it will be 30 ft. in height at the centre tower, diminishing at each end to 22 feet 9 inches; the clear space for the trains is 13 feet 5 in., and the whole width outside 14 feet 8 inches. The plates are of the largest size which can be rolled by existing machinery, some being 12 feet in length by 2 feet 4 inches wide, $\frac{3}{16}$ ths to $\frac{1}{4}$ ths of an inch thick, and weighing 7 cwt. each. Each large tube contains 327,000 rivets, and the entire bridge 2,000,000. Each tube contains about 10 miles of angle and T iron, and the whole bridge 65 miles, and the weight of each large tube is 1600 tons. The appearance of the interior of these tubes is very striking, from the regularly diminishing perspective; and their appearance outside, when fixed in their proper position, will be much lighter than can be well conceived on looking at their huge bulk on a close approach; when raised to their intended height, 100 feet above the water, and viewed in connection with the towers and abutments, they will, undoubtedly, appear far more slender and graceful than now imagined. Tuesday last, a half past 5 o'clock in the afternoon, was fixed for the floating of the large tube, and an immense concourse of persons were present; the railway had special trains, and parties were accommodated with return tickets available for two days; platforms were erected on the Carnarvonshire side to accommodate from 3000 to 4000 people, from which an excellent view of the proceedings could be obtained. One point of great attraction was the massive stages and scaffolding, most probably the largest ever constructed. Round the Britannia tower it rises to 250 feet, and is composed of whole balks of timber, from 12 to 16 feet square, and some of them 60 feet long, similar to those at the new Houses of Parliament. There are 570,000 cubic feet of timber employed in its construction, and it is capable of sustaining 2000 tons.

At 8 o'clock the spectators, by tens of thousands, had taken their places upon the piers, the tubes and shores on either side, and the Straits, for a mile in length, presented a vast amphitheatre of human beings; while multitudes of yachts, boats, and other craft filled with people, and gaily decorated, passed up and down the stream. Soon after this period from 200 to 300 pilots took their stand on the pontoons to work the enormous tackle; cables six inches in thickness, and three miles in length, were attached to the steamers which were to tow the monster to the spot from which it is to be raised, and all eyes at this moment were fixed with mingled confidence and fear on the gigantic work, and on Mr. Stephenson and Capt. Claxton, who were alone on the top of the tube. On a sudden the first signal flag sprang up on the Anglesea side, answered by a shrill blast from the trumpet of Capt. Claxton, piping all hands to the task, when a loud burst of cheers arose from the multitudes employed, whose united efforts, with those of the steam tugs, was soon apparent, and the *leviathan* mass began to move slowly and majestically, amidst the most deafening cheers, when, unfortunately, one of the main capstans broke, by which further progress was impossible, and the floating was again commenced at 7 o'clock on Wednesday morning.

Long before this hour vast multitudes had again assembled, but were a second time doomed to disappointment, the same captain again giving way; but we are happy to announce that at half-past nine on Wednesday evening the tube was safely placed on its bed, ready for raising to its final destination, amidst loud demonstrations of approbation from all the spectators assembled, and the firing of cannon for half an hour after the successful result. It was floated obliquely, and one end brought against the centre pier, then gradually swung round, its face to the space between the piers. The swinging the other end round to the tower on the Anglesea side was a work of great risk and anxiety; fortunately, such was the nicety of the arrangements, and the rapidity of the directing movements, that the final step was perfectly successful, and, by the vigorous action of a gigantic implement like a vice, the tube was clenched at its extremity, and in an instant held fast. On this occasion, in addition to Mr. Stephenson and Captain Claxton, Mr. Clarke, Mr. Brunel, and Mr. Locke were on the tube, rendering valuable and unceasing assistance throughout the perilous process.

The next operation, that of elevating the tube to its permanent position, will be accomplished as soon as possible. This is to be done by huge hydraulic presses of a magnitude commensurate with the size of the works, one cylinder alone being almost large enough at the entrance to contain a man standing, and of the ponderous weight of 40 tons. It is the most powerful machine ever constructed. The two end tubes will then be raised, and it is expected, from the rapidity of the movements, that this great iron highway over the Straits will be ready for the passage of trains in the autumn. The names of the gentlemen who have been continuously engaged on this great work since 1847 are—Captain Moorsom, the resident director; Mr. Frank Forster, resident engineer; Messrs. E. and L. Clarke and Wild, assistant engineers; Messrs. Nowell, Hemingway, and Pearson, contractors for the masonry, and Mr. T. E. Rawlinson, chief inspector of masonry; Messrs. Mare, of Blackwall, and Messrs. Garforth, of Dunkinfield, contractors for the iron tubes; Mr. J. Greaves, general manager of the masonry; Messrs. J. and A. Greaves, contractors for the scaffolding and stages. Mr. G. Campbell, engineer of the tube work, and Messrs. J. Morris and H. Hodgkinson, managers of it, all of whom were present.

OXFORD, WORCESTER, AND WOLVERHAMPTON RAILWAY COMPANY.—MR.

G. B. Thorneycroft, the active iron manufacturer, of Wolverhampton, has addressed a letter to the directors and shareholders of the above company, proposing a plan for releasing them from their present humbling position, and place them in a prosperous one, without the aid of the Great Western, the London and North-Western, or any other Western whatever. He justly assumes, that from Worcester to Wolverhampton is the cream end of the line, and from Worcester to Oxford the skim milk end; and he thinks he can point out a plan by which they can secure the cream, and give them the skim who have refused to supply fodder—a plan which will place them up to their knees in clover. We will let Mr. Thorneycroft here speak for himself; he says—"We have plenty of rails paid for, to lay down the narrow gauges from Worcester to Wolverhampton—the land, much of it bought—the work, much of it done. Our Act compels us to lay down the narrow gauge as well as the broad; on that ground, therefore, we are travelling in a straight and lawful course. Only get the line open, and make your low level station, the Shrewsbury and Birmingham will be made into that station, and we (the Shrewsbury and Birmingham) will run all the trade we can into your line. In fact, you get by the Chester and Shrewsbury, Shrewsbury and Wolverhampton, and the South Staffordshire lines, all the traffic to the west of England, instead of sending it round by Birmingham. All the traffic from North Wales, Shropshire, and Cheshire, goes on your line; all for the west, from Lancashire; and all from the north, by the South Staffordshire, will come on to it for the west; so that by just completing this part of our line with the narrow gauge, which you have in your power to do easily, you will be furnished with a traffic which will make the line at once as productive as even the Great Western itself." After pointing out numerous advantages which must follow the adoption of this plan, he says—"If you do not adopt it, I can see nothing but utter ruin before our eyes; and let me warn you that there is no time for procrastination, for once let your opponents get possession of the traffic I have pointed out, and it will not be very easy to get it back again. Only strike the blow now, and the battle is your own; only postpone it, and your ruin is certain. So convinced am I of its certain success, if this line of policy is pursued, that not only will I renew my debenture when due, but I will double it, if not treble it, for I know the security will be good, and I know that my 6000*l.* worth of shares, now worth about 2000*l.*, will be at par, if not at a premium, within two months after the line from Worcester to Wolverhampton shall be open. On the contrary, stand as you are, and in a short time the property will not be worth a shilling, after paying back the money borrowed."

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The Judicial Committee of the Privy Council having declared that the AXLES MADE BY THE PATENT SHAFT AND AXLE-TREE COMPANY

had proved a PUBLIC BENEFIT in greatly conducing to the SAFETY of RAILWAY TRAVELLING, the exclusive right to manufacture has been extended for four years, on condition that the practice of charging a moderate price, proved hitherto to have been pursued, should be made imperative.

It was also proved that these Axles were in general use—upwards of 100,000 having been supplied to the English and Continental Railways, among whom are the London and North-Western, the Midland, and the Great Western; that they had withstood frequently severe tests applied by the engineers of these railways for the purpose of experiment, and others still more severe to which they were accidentally subjected in use. In one such instance a Patent Axle, 4½ inches in diameter, sustained the whole force of a heavy train going at the rate of 60 miles an hour, by which it was twisted and bent nearly double, without showing the least fracture.

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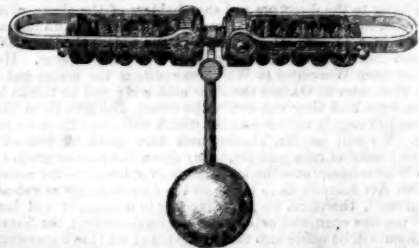
The use of this principle, combined with experience gained of the quality and admixture of the iron and mode of treatment best adapted to resist the strain to which an axle is subjected, enables the Patent Shaft Company uniformly to supply safe axles.

In all cases where the use of the Patent Shaft Company's Axles are specified for, it is respectfully recommended that information be sent to the works; for, although every Patent Axle is stamped with the company's name, worthless axles, made at an expense little beyond that of common bar-iron, have, in many instances, been substituted.

It was given in evidence before the Privy Council, by Robert Stephenson, Esq., M.P., that having, in consequence of an accident, tested a number of such common axles, he found 48 out of 50 broke so easily as to be perfectly unfit for use; that he ordered them all to be removed, and that he has since recommended the Patent Axles to be used exclusively.

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PART THE FIRST treats of the anatomy and physiology of the reproductive organs, and is illustrated by six coloured engravings.—PART THE SECOND treats of the consequences resulting from excessive indulgence, and their lamentable effects on the system, producing mental and bodily weakness, nervous excitement, and generative incapacity; it is illustrated by three explanatory engravings.—PART THE THIRD treats of the diseases resulting from infection, either in the primary or secondary form, and contains an explicit direction for their treatment. This section is illustrated by 17 coloured engravings.

PART THE FOURTH contains a prescription for the prevention of disease by a simple application, by which the danger of infection is obviated. This important part of the work should not escape the reader's notice.—PART THE FIFTH is devoted to the consideration of marriage and its duties. The causes of unproductive unions are also considered, and the whole subject critically and philosophically inquired into.

THE CORDIAL BALM OF SYRIACUM is exclusively employed in treating nervous and sexual debility, impotency, &c., 11s